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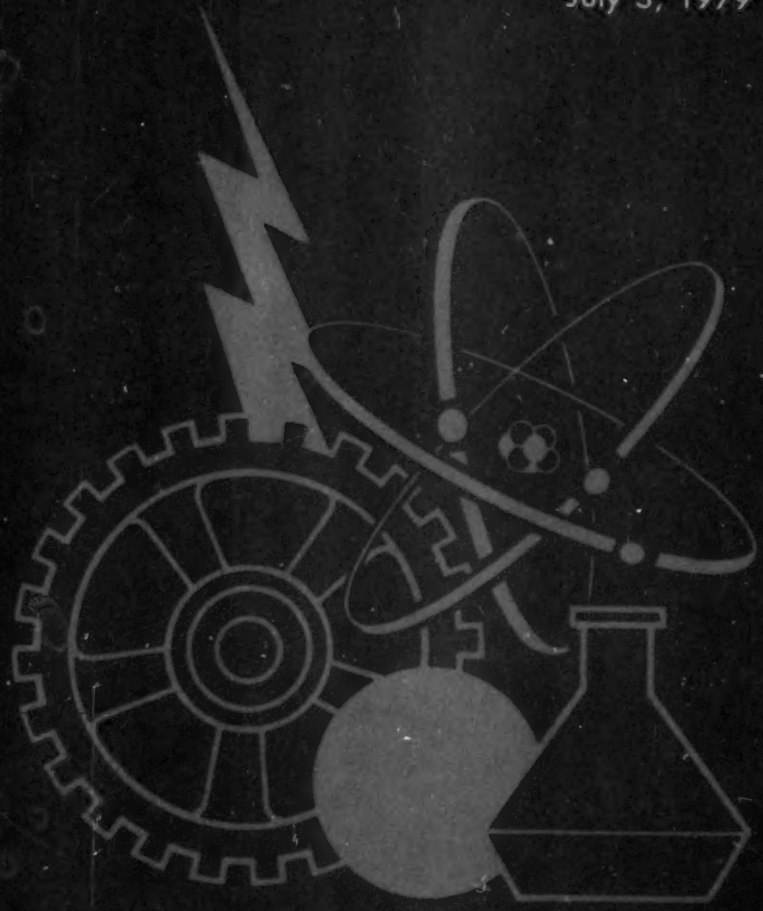

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

July 3, 1979 Volume 984 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) : Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER,
Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

Update of Information Concerning the Patent Cooperation Treaty

TOPIC 1: INCREASE IN INTERNATIONAL FEES EFFECTIVE AUGUST 1, 1979

Effective August 1, 1979, any international fees (basic and designation fees) for the processing of International applications must be paid in the revised amounts indicated below.

The amount of the basic fee portion of the International fee under PCT Rule 15.1(i) is being increased from $165 to $190 for an international application containing 30 sheets or less, effective August 1, 1979.

The amount of the supplement fee to the basic fee for each page of the international application in excess of 30 sheets is being raised from the current $3 per page to $3.50 per page, effective August 1, 1979.

The amount of the designation fee portion of the International fee under PCT Rule 15.1(ii) is being raised from $40 to $45, effective August 1, 1979.

These fee increases were adopted by the PCT Assembly on May 1, 1979 to help cover the operating costs of the International Bureau. There is no change in the $35 transmittal fee or $300 search fee which are set by the Commission of Patents and Trademarks. Applicants are reminded that the basic fee and any supplement to the basic fee must be paid in full upon filing to avoid withdrawal of the International application. The use of deposit accounts and specifically the authorization for the United States Receiving Office to use deposit accounts to correct any deficiency in PCT fees is strongly encouraged.

TOPIC 2: LIST OF CONTRACTING STATES AS OF MAY 25, 1979

State	*Ratification or Accession*	*Date of Ratification or Accession*	*Date From Which State May Be Designated*
(1) Central African Empire*	Accession	15 September 1971	01 June 1978
(2) Senegal*	Ratification	08 March 1972	01 June 1978
(3) Madagascar	Ratification	27 March 1972	01 June 1978
(4) Malawi	Accession	16 May 1972	01 June 1978
(5) Cameroon*	Accession	15 March 1973	01 June 1978
(6) Chad*	Accession	12 February 1974	01 June 1978
(7) Togo*	Ratification	28 January 1975	01 June 1978
(8) Gabon*	Accession	06 March 1975	01 June 1978
(9) United States of America	Ratification	26 November 1975	01 June 1978
(10) Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11) Congo*	Accession	08 August 1977	01 June 1978
(12) Switzerland**	Ratification	14 September 1977	01 June 1978
(13) United Kingdom**	Ratification	24 October 1977	01 June 1978
(14) France**	Ratification	25 November 1977	01 June 1978
(15) Soviet Union	Ratification	29 December 1977	01 June 1978
(16) Brazil	Ratification	09 January 1978	01 June 1978
(17) Luxembourg**	Ratification	31 January 1978	01 June 1978
(18) Sweden**	Ratification	17 February 1978	01 June 1978
(19) Japan	Ratification	01 July 1978	01 October 1978
(20) Denmark	Ratification	01 September 1978	01 December 1978
(21) Austria**	Ratification	23 January 1979	23 April 1979
(22) Monaco	Ratification	22 March 1979	22 June 1979
(23) Netherlands**	Ratification	10 April 1979	10 July 1979
(24) Romania	Accession	23 April 1979	23 July 1979

* Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI member states. A designation of any state is an indication that all OAPI states have been designated. Note: only one designation fee is due regardless of the number of OAPI member states designated.

** Members of European Patent Convention (EPC) regional patent system. Either national patents or European patents for member States are available through PCT, except for France, for which only European patents are available if PCT is used. If regional protection is desired for one or more States, the indication "regional patent" must follow the designation of the State or States. Note: only one designation fee is due if the regional patent protection is sought.

TOPIC 3: CHANGES IN THE PCT RULES

The following PCT Rule changes, adopted by the PCT Assembly on May 1, 1979 become effective on August 1, 1979 with the exception of the changes in PCT Rule 47 which became available on May 1, 1979.

RULE 15

The International Fee

15.1 *Basic Fee and Designation Fee*

Each international application shall be subject to the payment of a fee for the benefit of the International Bureau ("international fee") to be collected by the receiving Office and consisting of,

(i) a "basic fee," and

(ii) as many "designation fees" as there are national patents and regional patents sought by the applicant in the international application, except that, where Article 44 applies in respect of a designation, only one designation fee shall be due.

15.2 *Amounts*

(a) The amounts of the basic fee and of the designation fee are as set out in the Schedule of Fees.

(b) The amounts of the basic fee and of the designation fee shall be established, for each receiving Office which, under Rule 15.3, prescribes the payment of those fees in a currency or currencies other than Swiss currency, by the Director General after consultation with that Office and in the currency or currencies prescribed by that Office ("prescribed currency"). The amounts in each prescribed currency shall be the equivalent, in round figures, of the amounts in Swiss currency set out in the Schedule of Fees. They shall be published in the Gazette.

(c) Where the amounts of the fees set out in the Schedule of Fees are changed, the corresponding amounts in the prescribed currencies shall be applied from the same date as the amounts set out in the amended Schedule of Fees.

(d) Where the exchange rate between Swiss currency and any prescribed currency becomes different from the exchange rate last applied, the Director General shall establish new amounts in the prescribed currency according to directives given by the Assembly. The newly established amounts shall become applicable two months after the date of their publication in the Gazette, provided that the interested Office and the Director General may agree on a date falling amounts shall become applicable for that Office from that date.

15.3 *Mode of Payment*

The international fee shall be payable in the currency or currencies prescribed by the receiving Office, it being understood that, when transferred by the receiving Office to the International Bureau, the amount transferred shall be freely convertible into Swiss currency.

15.4 *Time of Payment*

(a) Subject to paragraph (c), the basic fee shall be due on the date of receipt of the international appliaction.

(b) Subject to paragraph (c), the designation fee shall be paid on the date of receipt of the international application or on any later date prior to the expiration of one year from the priority date.

(c) The receiving Office may permit applicants to pay either the basic fee or the designation fee or both of the fees later than on the dates provided for in paragraphs (a) and (b), provided that:

(i) permission shall not be given to pay the basic fee or the designation fee later than one month after the date of receipt of the international application;

(ii) permission may not be subject to any extra charge. Such later payment of the said fees shall be without loss, in the case of the basic fee, of the international filing date, or, in the case of the designation fee, of the designations to which the payment relates.

15.5 *Partial Payment*

(a) Where the amount of the international fee received by the receiving Office is not less than that of the basic fee and at least one designation fee but less than the amount required to cover the basic fee and all the designations made in the international application, the amount received shall be applied as follows:

(i) to cover the basic fee, and

(ii) to cover as many designation fees as, after deduction of the basic fee, may be covered in full by the amount received in the order indicated in paragraph (b).

(b) The order in which the said amount shall be applied to the designations shall be established as follows:

(i) where the applicant indicates to which designation or designations the amount is to be applied, it shall be applied accordingly but, if the amount received is insufficient to cover the designations indicated, it shall be applied to as many designations as are covered by it in the order chosen by the applicant in indicating the designations;

(ii) to the extent that the applicant has not given the indications under item (i), the amount or the balance thereof shall be applied to the designations in the order in which they appear in the international application;

(iii) where the designation of a State is for the purposes of a regional patent and provided that the required designation fee is, under the preceding provisions available for that designation, the designation of any further States for which the same regional patent is sought shall be considered as covered by that fee.

15.6: [No change]

RULE 16

The Search Fee

16.1 *Right to Ask for a Fee*

(a) [No change]

(b) The search fee shall be collected by the receiving Office. The said fee shall be payable in the currency or currencies prescribed by that Office ("the receiving Office currency"), it being understood that, if any receiving Office currency is not that, or one of those, in which the International Searching Authority has fixed the said fee ("the fixed currency or currencies"), it shall, when transferred by the receiving Office to the International Searching Authority, be freely convertible into the currency of the State in which the International Searching Authority has its headquarters ("the headquarters currency"). The amount of the search fee in any receiving Office currency, other than the fixed currency or currencies, shall be established by the Director General after consultation with that Office. The amounts so established shall be the equivalents, in round figures, of the amount established by the International Searching Authority in the headquarters currency. They shall be published in the Gazette.

(c) Where the amount of the search fee in the headquarters currency is changed, the corresponding amounts in the receiving Office currencies, other than the fixed currency or currencies, shall be applied from the same date as the changed amount in the headquarters currency.

(d) Where the exchange rate between the headquarters currency and any receiving Office currency, other than the fixed currency or currencies, becomes different from the exchange rate last applied, the Director General shall establish the new amount in the said receiving Office currency according to directives given by the Assembly. The newly established amount shall become applicable two months after its publication in the Gazette, provided that any interested receiving Office and the Director General may agree on a date falling during the said two-month period in which case the said amount shall become applicable for that Office from that date.

(e) Where, in respect of the payment of the search fee in a receiving Office currency, other than fixed currency or currencies, the amount actually received by the International Searching Authority in the headquarters currency is less than that fixed by it, the difference will be paid to the International Searching Authority by the International Bureau, whereas, if the amount actually received is more, the difference will belong to the International Bureau.

(f) As to the time of payment of the search fee, the provisions of Rule 15.4 relating to the basic fee shall apply.

16.2: [No change]

16.3: [No change]

RULE 47

Communication to Designated Offices

47.1 *Procedure*

(a) [No change]

(b) Such communication shall be effected promptly after the international publication of the international application and, in any event, by the end of the 19th month after the priority date. Where the time limit under Rule 46.1 has not expired when the communication is effected and the International Bureau has neither received amendments from the applicant nor a declaration that the applicant does not wish to make amendments before the International Bureau, the International Bureau shall, at the time of the communication, notify the applicant and the designated Offices accordingly; it shall, immediately after receipt, communicate any amendment received subsequently to the designated Offices and notify the applicant accordingly. Where, under Article 17(2)(a), the International Searching Authority has made a declaration that no international search report will be established, the communication shall be effected, unless the international application is withdrawn, within 1 month from the

date on which the International Bureau has been notified of the said declaration by the International Searching Authority; such communication shall be accompanied by an indication of the date of the notification sent to the applicant under Article 17(2)(a).

(c) [No change]

(d) [No change]

(e) [No change]

47.2 *Copies*

(a) [No change]

(b) [No change]

(c) Except to the extent that any designated Office notifies the International Bureau otherwise, copies of the pamphlet under Rule 48 may be used for the purposes of the communication of the international application under Article 20.

RULE 57

The Handling Fee

57.1 *Requirement to Pay*

(a) Each demand for international preliminary examination shall be subject to the payment of a fee for the benefit of the International Bureau ("handling fee") to be collected by the International Preliminary Examining Authority to which the demand is submitted.

(b) Where, because of a later election or elections, the international preliminary examination report must, in application or Article 36(2), be translated by the International Bureau into one or more additional languages, a "supplement to the handling fee" shall be collected by the International Bureau.

57.2 *Amounts of the Handling Fee and the Supplement to the Handling Fee*

(a) The amount of the handling fee is as set out in the Schedule of Fees. The amount payable in any particular case shall be the amount as so set out, increased by as many times the same amount as the number of languages into which the international preliminary examination report must, in application of Article 36(2), be translated by the International Bureau.

(b) The amount of the supplement to the handling fee is as set out in the Schedule of Fees. The amount payable in any particular case shall be the amount as so set out, multiplied by the number of additional languages referred to in Rule 57.1(b).

(c) The amount of the handling fee shall be established, for each International Preliminary Examining Authority which, under Rule 57.3(c), prescribes the payment of the handling fee in a currency or currencies other than Swiss currency, by the Director General after consultation with that Authority and in the currency or currencies prescribed by that Authority ("prescribed currency"). The amount in each prescribed currency shall be the equivalent, in round figures, of the amount of the handling fee in Swiss currency set out in the Schedule of Fees. The amounts in the prescribed currencies shall be published in the Gazette.

(d) Where the amount of the handling fee set out in the Schedule of Fees is changed, the corresponding amounts in the prescribed currencies shall be applied from the same date as the amount set out in the amended Schedule of Fees.

(e) Where the exchange rate between Swiss currency and any prescribed currency becomes different from the exchange rate last applied, the Director General shall establish the new amount in the prescribed currency according to directives given by the Assembly. The newly established amount shall become applicable two months after its publication in the Gazette, provided that the interested International Preliminary Examining Authority and the Director General may agree on a date falling during the said two-month period in which case the said amount shall become applicable for that Authority from that date.

57.3 *Time and Mode of Payment*

(a) The handling fee shall be due at the time the demand is submitted.

(b) Any supplement to the handling fee shall be due at the time the later election is submitted.

(c) The handling fee shall be payable in the currency or currencies prescribed by the International Preliminary Examining Authority to which the demand is submitted, it being understood that, when transferred by that Authority to the International Bureau, it shall be freely convertible into Swiss currency.

(d) Any supplement to the handling fee shall be payable in Swiss currency.

57.4 *Failure to Pay (Handling Fee)*

(a) Where the handling fee is not paid as required, the International Preliminary Examining Authority shall invite the applicant to pay the fee within one month from the date of the invitation.

(b) If the applicant complies with the invitation within the prescribed time limit, the demand shall be considered as if it had been received on the date on which the International Preliminary Examining Authority receives the fee, unless, under Rule 60.1(b), a later date is applicable.

(c) If the applicant does not comply wtih the invitation within the prescribed time limit, the demand shall be considered as if it had not been submitted.

57.5 *Failure to Pay (Supplement to the Handling Fee)*

(a) Where the supplement to the handling fee is not paid as required, the International Bureau shall invite the applicant to pay the supplement within one month from the date of the invitation.

(b) If the applicant complies with the invitation within the prescribed time limit, the later election shall be considered as if it had been received on the date on which the International Bureau receives the supplement, unless, under Rule 60.2(b), a later date is applicable.

(c) If the applicant does not comply with the invitation within the prescribed time limit, the later election shall be considered as if it had not been submitted.

57.6 *Refund*

In no case shall the handling fee, or the supplement to the handling fee, be refunded.

RULE 96

The Schedule of Fees

96.1 *Schedule of Fees Annexed to Regulations*

The amounts of the fees referred to in Rules 15 and 57 shall be expressed in Swiss currency. They shall be specified in the Schedule of Fees which is annexed to these Regulations and forms an integral part thereof.

SCHEDULE OF FEES

Kind of Fee	*Amount*	
1. *Basic Fee:* (Rule 15.2(a))		
if the international application contains not more than 30 sheets	325	Swiss francs
if the international application contains more than 30 sheets	325	Swiss francs plus 6 Swiss francs for each sheet in excess of 30 sheets
2. *Designation Fee:* (Rule 15.2 (a))	78	Swiss francs
3. *Handling Fee:* (Rule 57.2(b))	100	Swiss francs
4. *Supplement to the Handling Fee:* (Rule 57.2(a))	100	Swiss francs

TOPIC 4: CHANGES IN THE ADMINISTRATIVE INSTRUCTIONS

The following modifications in the Administrative Instructions have been promulgated by the Director General of the World Intellectual Property Organization in accordance with PCT Rule 89.2 with effect from November 9, 1978.

SECTION 107

Identification of International Authorities

[Only the modification is specified]

The example of Section 107(b), is modified to read "(e.g., "RO/JP," "ISA/US," "IPEA/SU")."

SECTION 201

Names of States: Cancellation of Designations

(a) The name of any State referred to in the request shall be indicated either by the full name of the State or by a

generally accepted short title which, if the indications are in English or French, shall be as appears in *Annex A*. The receiving Office, or the International Bureau where the receiving Office fails to do so, shall insert, in the appropriate space provided for in the request Form, the two-letter country code as appears in *Annex B* (for example, where France is the third designated State in Box V of the request form, "FR 3. France" or "FR 3. French Republic").

(*b*) The receiving Office shall cancel *ex-officio* the designation of States other than Contracting States, and inform the applicant promptly of such action. If the international application has already been sent to the International Bureau and the International Searching Authority, the receiving Office shall also notify promptly that Bureau and that Authority. In any event, the International Bureau shall, where the receiving Office fails to do so, cancel *ex-officio* the designation of States other than Contracting States and inform the applicant, the receiving Office and the International Searching Authority promptly of such action.

SECTION 203bis
National and Regional Patents

Where the request of the international application contains a designation of a Contracting State without an indication of the wish to obtain a regional patent and also a designation of the same Contracting State with an indication of the wish to obtain a regional patent and the national law of the Contracting State does not contain a provision referred to in Article 45(2), the receiving Office shall calculate the designation fees on the basis that a separate fee is payable in respect of the designation of the Contracting State in addition to the designation fee payable in respect of that Contracting State as a Contracting State or as one of a group of Contracting States for which a regional patent is sought.

SECTION 317
Procedure in the Case of the Designation of a State being Considered Not To Have Been Made

Where the receiving Office finds that, under Rule 18.4(b), the designation of a State is to be considered as not having been made, it shall indicate that fact in the international application by enclosing the designation of that State within square brackets and entering the words "CONSIDERED NOT TO HAVE BEEN MADE," or their equivalent in the language of the international application, in the margin, and shall promptly notify the applicant accordingly. If copies of the international application have alrealy been sent to the International Bureau and the International Searching Authority, the receiving Office shall also notify promptly that Bureau and that Authority.

SECTION 412
Fee for Copies of Certain Documents

(*a*) The International Bureau shall make a charge of 6 Swiss francs to designated and elected Offices for a copy of any document cited in the international search report requested under Rule 44.3(c) or any document cited in the international preliminary examination report requested under Rule 71.2(c).

(*b*) When mailing by air is requested the actual cost of such mailing shall be additionally charged.

SECTION 503
Method of Identifying Documents Cited in the International Search Report

[Only the modification is specified]

In the example given in Section 503(a), the number of the patent document is modified to read: "JP, B, 50–14535."

ANNEX C

Standard Code for Identification of Different Kinds of Patent Documents
[Only the modification is specified]

The entries concerning Japan and the United States of America appearing in Appendix II of this Annex are modified to read as follows:

Japan	公開特許公報 (Kôkai tokkyo kôhô)	Published unexamined patent application	Patent application published before examination as to novelty in the sense of paragraphs 6(i) and 6(ii).	A	
	特許公報 (Tokkyo kôhô)	Published examined patent application	Patent application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii).		
			- 1st publication. A Kôkai tokkyo kôhô not published. "T" headed the numerical number of Tokkyo kôhô published from 1922 to 1926.	B	1
			- 2nd publication. Normally following an A Kôkai tokkyo kôhô.	B	2
	特許発明明細書 (Tokkyo hatsumei meisaisyo)	Patent specification	Patent (old law) published in the sense of paragraphs 6(i) and 6(ii).		
			- 1st publication. Tokkyo kôhô not published.	C	1
			- 2nd publication. Normally following a B 1 Tokkyo kôhô.	C	2
	特許審判請求公告 (Tokkyo shinpan Seikyû kôkoku)	Corrected patent specification	Corrected patent published in the sense of paragraphs 6(i) and 6(ii).	H	
	意匠公報 (Isyô kôhô)	Registered design publication	Registered design application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii).	S	
	公開実用新案公報 (Kôkai jitsuyô shinan kôhô)	Published unexamined utility model application	Utility model application published before examination as to novelty in the sense of paragraphs 6(i) and 6(ii)	U	

Standard Code for Identification of Different Kinds of Patent Documents (Continued)

Japan (contd)	実用新案公報 (Jitsuyô shinan kôhô)	Published examined utility model application	Utility model application published after examination as to novelty in the sense of paragraphs 6(i) and 6(ii)		
			- 1st publication. U Kôkai jitsuyô shinan kôhô not published. "T" headed the numerical number of Jitsuyô shinan kôhô published from 1922 to 1926.	Y	1
			- 2nd publication. Normally following a U Kôkai jitsuyô shinan kôhô.	Y	2
	登録実用新案 (Tôroku jitsuyô shinan)	Registered utility model specification	Registered utility model published in the sense of paragraphs 6(i) and 6(ii)		
			- 1st publication Jitsuyô shinan kôhô not published	Z	1
			- 2nd publication. Normally following a Y 1 Jitsuyô shinan kôhô.	Z	2
	登録実用新案審判請求公告 (Tôroku jitsuyô shinan shinpan seikyû kôkoku)	Corrected registered utility model specification	Corrected registered utility model published in the sense of paragraphs 6(i) and 6(ii).	I	
United States of America	Patent Plant Patent Design Patent		Patent published in the sense of paragraph 6(ii)	A P S	
	Reissue Patent		Patent reissued and republished in the sense of paragraph 6(ii)	E	
	Defensive Publication		Patent application published without examination or assertion as to novelty, in the sense of paragraph 6(i)	H	
	Defensive Publication		Patent document published in the sense of paragraph 5: Entry of an abstract of the application in the Official Gazette	H	
	Defensive Publication		Patent document published in the sense of paragraph 6(ii): Abstract of an application published in a discreet document form distinctively numbered in a numerical series unique to Defensive Publications.	H	

TOPIC 5: PATENT COOPERATION TREATY DOCUMENTS AVAILABLE

1. Documents Concerning the PCT Available From the United States Patent and Trademark Office

PCT Document	*Price*
Patent Cooperation Treaty including Regulations (48 pages).	Free
Request forms, including fee calculation sheet (form PCT/RO/101 and annex, 6 pages) *Note:* the Request form is a necessary part of the international application.	Free
PCT International Application transmittal letter (form PTO–1382).	Free
Declaration form under 37 CFR 1.70 for entering the national stage in the United States of America as a designated office.	Free
Transmittal form for use when filing in the United States of America as a designated office.	Free

Orders for PCT Documents available from the U.S. Patent and Trademark Office may be office by mail or by telephone.

Mail Order Address:

Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Telephone Order:

PCT operations
(703) 557–2003

2. Documents Concerning the PCT Available From the *World Intellectual Property Organization (WIPO)* (Prices in U.S. dollars per copy, including mailing charges). Note: Prices are subject to change. Consult the OFFICIAL GAZETTE of the U.S. Patent and Trademark Office for a listing of current prices. These prices remain valid for all orders received up to December 31, 1979.

Prices in US dollars per copy, including mailing charges

	By surface mail	By airmail
PCT Published International Application (pamphlet) and Search Report	$3.50	$4.50
PCT Applicant's Guide: English edition, December 1978 / French edition, April 1979	30.00	40.00
PCT (Treaty and Regulations)	4.50	5.50
PCT Gazette: subscription for 1978	50.00	60.00
subscription for 1979	145.00	155.00
single issues (1978 and/or 1979)	7.00	8.00
Items of Non-Patent Literature under PCT Rule 34.1(b)(iii) (included in the PCT Gazette No. 2/78 (previously document PCT/INT/1))	7.00	8.00
Administrative Instructions under the Patent Cooperation Treaty (included in the PCT Gazette No. 1)	7.00	8.00
As a separate A4 brochure	4.00	5.00
With its Annexes (all PCT Forms) (previously document PCT/INT/2)	25.00	30.00
Receiving Office Guidelines for the Processing of International Applications under the Patent Cooperation Treaty (document PCT/INT/4)	3.50	4.50
Guidelines for International Search to be Carried Out under the Patent Cooperation Treaty (document PCT/INT/5)	2.50	3.00
Guidelines for International Preliminary Examination to be Carried Out Under the Patent Cooperation Treaty (document PCT/INT/6)	3.50	4.50
Guidelines for Drawings under the Patent Cooperation Treaty (document PCT/INT/7)	First copy free of charge.	
	For each additional copy: 0.50	1.00
Guidelines for Preparation of Abstracts under the Patent Cooperation Treaty (document PCT/INT/8)	First copy free of charge.	
	For each additional copy: 0.50	1.00
Guidelines for Publication under the Patent Cooperation Treaty (document PCT/INT/9)	5.00	6.00
Time Limits under the Patent Cooperation Treaty (document PCT/INT/10)	6.00	6.00
Records of the Washington Diplomatic Conference (1970)	63.00	76.00

Mode of ordering and paying

Orders should be addressed to:
WIPO—World Intellectual Property Organization
PCT Division—Fees, Sales and Statistics Section

If by mail:
34, chemin des Colombettes
1211 Geneva 20
Switzerland

If by telex:
22376 WIPO CH

If by telephone:
99 91 11 (ask for the PCT Division—Fees, Sales & Statistics Section)

Payments may be effected by check or by transfer to the account of the International Bureau at the Swiss Credit Bank, 1211 Geneva 11 (Switzerland).

On request, the International Bureau will send you an invoice.

TOPIC 6: REMINDERS FOR PCT INTERNATIONAL APPLICATION APPLICANTS

a. Applicants are responsible for filing a copy of any priority document wtih the International Bureau in Geneva, Switzerland within 16 months of the priority date. Applicants filing international applications with the United States Receiving Office may *at the time of filing* request the Receiving Office to prepare a certified copy of the priority document and forward it to the International Bureau. Such request must include payment for the certified copy by check or authorization to charge a deposit account. Item 1 of form PTO–1382, PCT International Application Transmittal Letter, may be used to request certified copy preparation and to indicate means of payment.

b. Any amendments to the claims under PCT Article 19 filed after receiving the search report *must be sent directly to the International Bureau* in Geneva, Switzerland. Such amendments should not be sent by the applicant to either the Receiving Office or the International Searching Authority.

c. Any questions concerning the filing of international applications or processing under the Patent Cooperation Treaty may be addressed to the PCT operations staff in person in Building 2, Room 4C08 or by telephone to (703) 557–2003.

DONALD W. BANNER,
June 4, 1979. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of May 1979

Affirmed	201
Affirmed in Part	38
Reversed	85
Total	324

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,305,873, Re. S.N. 002,144, Filed Jan. 9, 1979, Cl. 346/112, GRAPHIC RECORDER, Jean Mourier, Owner of Record: *Benson France, Fonlenay-Sous-Bois, France,* Attorney or Agent: A. D. Caesar, et al., Ex. Gp.: 211

3,886,949, Re. S.N. 030,227, Filed Apr. 16, 1979, Cl. 128/360, BABY SOOTHER, Eric Kenneth Hurst, et al., Owner of Record: *Lewis Woolf Griptight Limited, Birmingham, England,* Attorney or Agent: Marcus B. Finnegan, et al., Ex. Gp.: 335

3,981,360, Re. S.N. 032,515, Filed Apr. 23, 1979, Cl. 166/224 R, WELL TUBING DRAIN, Anil Marthe, Owner of Record: *Cook Testing Co., Long Beach, Calif.,* Attorney or Agent: James P. Lower, Ex. Gp.: 354

4,045,988, Re. S.N. 031,558, Filed Apr. 19, 1979, Cl. 72/108, ROTARY FORMING MACHINE AND TOOL, Marvin R. Anderson, Owner of Record: *Anderson-Cook, Inc., Fraser, Mich.,* Attorney or Agent: Richard P. Barnard, et al., Ex. Gp.: 321

4,077,213, Re. S.N. 032,162, Filed Apr. 23, 1979, Cl. 60/500, WAVE DRIVEN GENERATOR, Glenn E. Hagen, Owner of Record: *Williams, Inc., New Orleans, La.,* Attorney or Agent: Arthur M. Dula, et al., Ex. Gp.: 341

4,083,389, Re. S.N. 958,665, Filed Nov. 8, 1978, Cl. 141/179, STAR-WHEEL INDEXING SYSTEM FOR AUTOMATIC FILLING MACHINES, Sidney Rosen, et al., Owner of Record: *National Instrument Company, Baltimore, Md.,* Attorney or Agent: Paul M. Craig, et al., Ex. Gp.: 243

PATENT NOTICES

Certificates of Correction for the Week of July 3, 1979

3,795,380	4,087,130	4,127,558	4,136,245
3,806,097	4,087,386	4,127,734	4,136,390
3,848,148	4,092,308	4,127,997	4,136,397
3,878,763	4,093,600	4,128,591	4,136,955
3,898,304	4,094,698	4,129,220	4,137,192
3,928,425	4,095,977	4,129,242	4,137,247
3,962,193	4,096,557	4,130,719	4,138,256
3,970,973	4,098,090	4,130,775	4,138,445
4,001,569	4,101,127	4,131,227	4,138,730
4,002,886	4,102,631	4,131,303	4,139,476
4,007,363	4,103,193	4,131,435	4,140,123
4,008,250	4,106,251	4,131,518	4,140,555
4,009,171	4,108,268	4,131,551	4,140,587
4,013,757	4,108,512	4,131,772	4,140,848
4,020,137	4,109,224	4,131,871	4,141,076
4,020,660	4,109,325	4,131,951	4,141,164
4,022,988	4,110,898	4,132,182	4,141,324
4,030,794	4,112,009	4,132,450	4,141,563
4,033,911	4,112,869	4,132,581	4,141,632
4,039,551	4,113,146	4,132,615	4,141,679
4,046,068	4,114,730	4,132,882	4,141,866
4,047,007	4,115,352	4,132,920	4,142,032
4,051,526	4,116,855	4,132,980	4,142,311
4,053,515	4,116,939	4,132,998	4,142,532
4,055,952	4,119,360	4,133,117	4,142,864
4,063,849	4,120,778	4,133,221	4,143,655
4,067,456	4,121,562	4,133,234	4,143,678
4,067,864	4,121,665	4,134,054	4,144,848
4,070,795	4,122,217	4,134,129	4,145,285
4,071,836	4,123,864	4,134,465	4,145,346
4,075,672	4,124,150	4,134,672	4,145,513
4,081,677	4,124,800	4,134,872	4,145,733
4,082,678	4,124,986	4,134,925	4,146,573
4,082,80[illegible]	4,125,129	4,134,936	4,148,841
4,084,74[illegible]	4,125,404	4,134,967	4,149,240
4,085,599	4,125,471	4,134,975	
4,085,704	4,126,616	4,136,196	
4,086,422	4,127,502	4,136,241	

Disclaimers

3,769,330.—*Edward J. Nikowitz*, Glen Rock, and *Robert F. Tavares*, Cedar Grove, and *William M. Easter, Jr.*, Hasbrouck Heights, N.J. 2-BUTYL-1-ALKYNYL-CYCLOALKAN-1-OLS AND DERIVATIVES THEREOF. Patent dated Oct. 30, 1973. Disclaimer filed Sept. 7, 1978, by the assignee, *Givaudan Corporation*.

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

3,869,182.—*Nils Bertil Glifberg*, Staffanstorp, Sweden. BALL BEARING. Patent dated Mar. 4, 1975. Disclaimer filed Apr. 17, 1979, by the inventor.

Hereby enters this disclaimer to claim 4 of said patent.

3,952,711.—*John A. Kimberley*, East Granby, Conn., and *Richard D. Kraus*, Chicopee, Mass. DIESEL INJECTION NOZZLE WITH INDEPENDENT OPENING AND CLOSING CONTROL. Patent dated Apr. 27, 1976. Disclaimer filed June 27, 1978, by the assignee, *AMBAC Industries, Inc.*

Hereby enters this disclaimer to claims 1–6 of said patent.

4,020,197.—*Horst Steffen*, Geldern, Germany. PROCESS FOR THE CATALYTIC SENSITIZATION OF NON-METALLIC SURFACES FOR SUBSEQUENT ELECTROLESS METALLIZATION. Patent dated Apr. 26, 1977. Disclaimer filed Mar. 5, 1979, by the inventor.

Hereby enters this disclaimer to claims 1, 2, 4, 5, 8–11 inclusive and 14 of said patent.

4,050,608.—*Roy E. Smith*, Columbus, Ohio. CROSS-SHAPED JOINT COVER MEMBER FOR GENERALLY RECTANGULAR COMPOSITE INSULATING PANELS FORMING WALL PORTION OF INSULATED CRYOGENIC LIQUID CONTAINER. Patent dated Sept. 27, 1977. Disclaimer filed Oct. 30, 1978, by the assignee, *Owens-Corning Fiberglas Corporation*.

Hereby enters this disclaimer to claims 22 through 95 of said patent.

4,099,999.—*Robert D. Burnham*, Los Altos Hills, and *Donald R. Scifres*, Los Altos, Calif. METHOD OF MAKING ETCHED-STRIPED SUBSTRATE PLANAR LASER. Patent dated July 11, 1978. Disclaimer filed Apr. 2, 1979, by the assignee *Xerox Corporation*.

Hereby enters this disclaimer to claim 2 of said patent.

4,150,062.—*William E. Garwood*, Haddonfield, and *Philip D. Caesar*, Princeton, and *James A. Brennan*, Cherry Hill, N.J. LIGHT OLEFIN PROCESSING. Patent dated Apr. 17, 1979. Disclaimer filed June 1, 1979, by the assignee, *Mobil Oil Corporation*.

The term of this patent subsequent to Mar. 9, 1995, has been disclaimed.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 323-4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 21, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-11-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-2-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	7-6-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-20-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-1-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	11-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	2-3-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-1-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-25-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-17-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-22-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-11-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	4-7-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-30-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	12-20-77

Expiration of patents: The patents within the range of numbers indicated below expire during April 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,027,553 to 3,031,668, inclusive
Plant Patents..... Numbers 2,135 to 2,142, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JULY 3, 1979

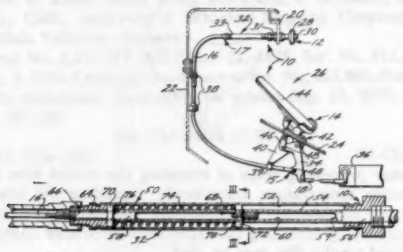
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T984,001
DECELERATOR MECHANISM

Orson K. Kelly, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 24, 1978, Ser. No. 899,432
Int. Cl.[2] F16C *1/10*
U.S. Cl. 74—501 R
1 Sheet Drawing. 6 Pages Specification



A decelerator mechanism for a vehicle has a speed control with a releasable lock and a complementing pivotal control connected by a control cable. Movement of the cable is controlled by a force biasing device. The force biasing device has first and second rods and associated stop elements co-acting with a spring for initially setting and holding a base engine operating speed, selectively reducing the base speed, in response to moving the pivotal control and automatically returning to the base speed in response to releasing the pivotal control.

T984,002
METHOD OF PRODUCING REVERSAL COLOR IMAGES

William H. Faul, and Patrick H. Saturno, both c/o Kodak Park Division, Rochester, N.Y. 14650

Continuation of Ser. No. 662,308, Mar. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 487,084, Jul. 10, 1974, abandoned. This application May 30, 1978, Ser. No. 910,398
Int. Cl.[2] G03C *5/50, 7/16*
U.S. Cl. 96—59
No Drawing. 31 Pages Specification

Reversal color images are produced in photographic elements which contain a ballasted primary aromatic amine and conventional ballasted color couplers. The photographic element is imagewise-exposed and a negative silver image is formed without forming a dye image. The residual silver halide in the photographic element is then fogged and developed to silver while concurrently forming a color dye image in the nonimagewise-exposed areas of the element. The developed silver is removed without removing the dye image.

T984,003
RECOVERY OF HIGH VISCOSITY NATIVE CRUDE SAMPLES

Thomas R. Sifferman, and Michael W. Britton, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

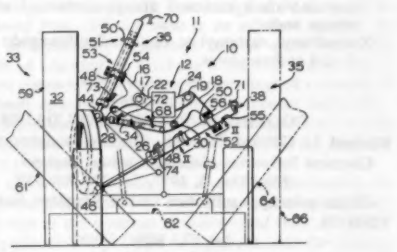
Filed Sep. 25, 1978, Ser. No. 945,675
Int. Cl.[2] E21B *47/00*
U.S. Cl. 166—264
No Drawing. 4 Pages Specification

Native bottomhole samples of very viscous crude oil (bitumen, tar) are obtained by injecting water plus a suitable surfactant mixture down a hollow sucker rod whereby mixing occurs downhole, producing a resultant oil-in-water emulsion, and recovering the crude oil from the emulsion. Contamination of the crude oil sample with light hydrocarbons is avoided.

T984,004
GRADER BLADE ACTUATOR

Carlisle S. Morris, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 826,213, Aug. 19, 1977, abandoned. This application Aug. 11, 1978, Ser. No. 932,839
Int. Cl.[2] E02F *3/76*
U.S. Cl. 172—793
1 Sheet Drawing. 8 Pages Specification



A grader blade actuator comprises a frame, a pair of pivot arms connected to said frame, a link member pivotally interconnecting the arms, a blade member, and a diagonal fluid cylinder connecting the link member to the blade member. The blade actuator further comprises a pair of fluid lift cylinders which are of a construction sufficient for connecting each pivot arm to a respective end portion of the blade member.

One or both of the lift cylinders has two or more spaced apart releasable connectors 48 and 50 or 48′ and 50′ which are selectively connectable to the respective pivot arm for providing vertical positioning of the blade member.

T984,005

YELLOW-DYE-FORMING COUPLERS

Philip T. S. Lau, Rochester, N.Y., assignor to Eastman Kodak Co., Rochester, N.Y.

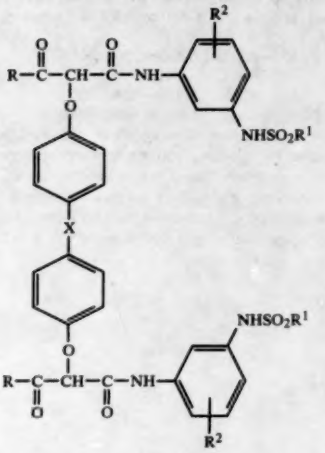
Division of Ser. No. 892,070, Mar. 31, 1978. This application Dec. 18, 1978, Ser. No. 970,497

Int. Cl.[2] C07C *143/75*

U.S. Cl. 260—401

No Drawing. 29 Pages Specification

Novel bis yellow-dye-forming couplers are incorporated in photographic emulsions and elements. The couplers are represented by the structural formula



I

where:

R is an aryl group of 6 to 12 carbon atoms, an aryloxyalkylene or arylthioalkylene group having 6 to 12 carbon atoms in the aryl portion of the group and 1 to 4 carbon atoms in the alkylene portion of the group, or an alkyl group of 1 to 8 carbon atoms;

R^1 is an alkyl group of 4 to 16 carbon atoms;

R^2 represents one or more halogen, lower alkyl, lower alkoxy, carboxy or lower alkoxycarbonyl substituents wherein the alkyl group and the alkyl portion of the alkoxy and alkoxycarbonyl groups contains 1 to 6 carbon atoms; and

X is sulfonyl, carbonyl or alkylenedisulfonamido containing 1 to 4 carbon atoms.

T984,006

COOLING TUBULAR EXTRUDATES

Michael L. Clifford, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 1, 1977, Ser. No. 856,515

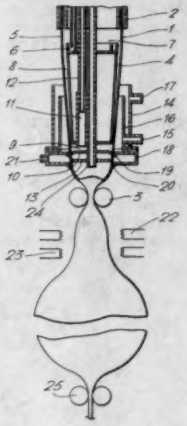
Claims priority, application United Kingdom, Dec. 14, 1976, 52078/76

Int. Cl.[2] B29C *25/00*

U.S. Cl. 264—89

1 Sheet Drawing. 17 Pages Specification

An improved method of cooling an extruded tube of plastics material such as a substantially crystalline polymer of propylene, is disclosed in which the extruded tube is fed, in the direction of extrusion, in heat-transfer relationship with an adjacent cooling surface, such as an internal mandrel extending axially within the extruded tube, while maintaining this cooling surface at a temperature below the melting point of the plastics material. Interposed between and in contact with the tube and the cooling surface is a continuous sheath of a heat transfer liquid having a dynamic viscosity at 20° C. of from 2 to 20,000 centipoise. Preferably the heat transfer liquid has a boiling point below that of the die during extrusion of the tube. An aqueous dispersion or solution of a viscosity modifier, such as a cellulosic resin, is used and supplied to the sheath at a rate of from 0.02 to 0.5 liters/minute/centimeter width of tube surface. The thus cooled tube is subsequently withdrawn from the cooling surface.



Further processing steps of reheating the cooled tube to its orienting temperature, transversely expanding the reheated tube by introducing a pressurizing gas into the tube and longitudinally extending the expanded tube to form a biaxially oriented tubular film may be used.

T984,007

JIG-SAW PUZZLES

John C. Richardson, Hitchen, England, assignor to Imperial Chemical Industries Limited, London, England

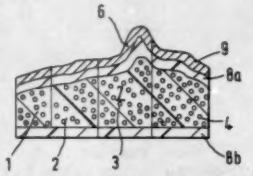
Continuation of Ser. No. 810,372, Jun. 27, 1977, abandoned. This application Jul. 26, 1978, Ser. No. 928,293

Claims priority, application United Kingdom, Jul. 9, 1976, 28677/76

Int. Cl.[2] A63F *9/12*

U.S. Cl. 273—157 R

1 Sheet Drawing. 15 Pages Specification



A jig-saw puzzle comprises interfitting pieces (**1, 2, 3, 4**) which when fitted together side-by-side form a three-dimensional upper surface simulating for example hills and valleys. Each piece is formed of a molded open or closed cell thermoplastics foamed core **7** sandwiched between upper and lower thermoplastics skins **8***a* and **8***b*. A printed sheet **9** is stuck on to the upper skin **8***a*. The skins **8***a* and **9***a* may be made from any conventional moldable thermoplastics. A preferred thermoplastics is a copolymer of propylene with from 5 to 20% by weight of ethylene made by injecting ethylene into the final stages of an otherwise propylene homopolymerization. The core may be made of the same or different plastics as the skins. Polyurethane is a preferred core material. The printed sheet, which may be paper or fabric, may be stuck on to the upper sheet with adhesive or by penetration or fusing of the skin material into the sheet during molding of the pieces.

REISSUES

JULY 3, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,040

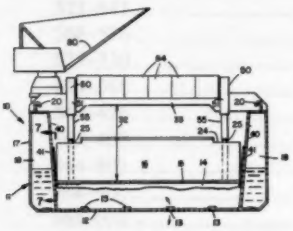
VESSEL FOR FLOTATION LOADING AND UNLOADING AND PARTIAL BUOYANCY SUPPORT OF BARGES AND OTHER FLOATING CARGOES

William E. Kirby, Hong Kong, and David J. Seymour, Daly City, Calif., assignors to Wharton Shipping Corporation, Edificio Vallarino, Panama

Original No. 3,913,512, dated Oct. 21, 1975, Ser. No. 511,492, Oct. 2, 1974. Continuation-in-part of Ser. No. 415,968, Nov. 8, 1973, abandoned. Application for reissue Sep. 27, 1977, Ser. No. 837,167

Int. Cl.[2] B63B *35/28*

U.S. Cl. 114—260 51 Claims



35. A vessel for transport of a floating buoyant cargo such as barges, lighters, and pontoons, wherein said cargo can be partially supported in the vessel by its own buoyancy, including in combination:

a hull having a bottom shell with rigid submarine cargo-supporting and hull-reinforcing structure, a bow, a stern, and side walls providing a series of buoyancy compartments, a hollow enclosed interior including a cargo hold, and conduit means communicating with said hold for passage of sea water into and out from said hold,

means for introducing and expelling water from said buoyancy compartments to adjust the draft, trim, and list of said vessel,

gate means in said hull for opening to enable flotation loading and unloading of said floating cargo and for closing during transportation thereof, and

securing means for releasably locking said cargo in place in said hold against movement relative to said hull all during a voyage of said vessel, with a lower portion of said cargo engaging said submarine cargo-supporting structure, said securing means including means for engaging an upper portion of said cargo,

whereby water in the flooded hold enables the buoyancy of the cargo to support the cargo, at least in part.

Re. 30,041

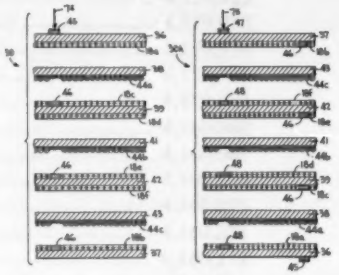
CARBONLESS MANIFOLD BUSINESS FORMS

George E. Maalouf, Niagara Falls, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Original No. 4,036,511, dated Jul. 19, 1977, Ser. No. 664,941, Mar. 8, 1976. Division of Ser. No. 561,623, Nov. 24, 1975, Pat. No. 3,981,523. Application for reissue Sep. 1, 1977, Ser. No. 829,825

Int. Cl.[2] B41M *5/22*

U.S. Cl. 282—27.5 2 Claims



1. A manifold set of carbonless recording sheets, comprising:

a stack including at least two superimposed sheets;

each of said sheets having on each of its surfaces, a coating comprising an initially colorless color forming reactive component,

a reactive component of each of the coatings of one of said sheet being *in a transferable form such that the same will be transferred from said one sheet to an adjacent sheet in response to application of pressure to said stack and being* capable of reacting to produce a colored mark with a reactive component of each of the coatings of a second of said sheets upon coming into reactive contact therewith,

said reactive component of each of the coatings of said second sheet being in a non-transferable form such that the produced mark is presented on said second sheet,

said one sheet being disposed in overlying relationship to said second sheet such that one of its coatings is disposed against one of the coatings of said second sheet, whereby upon application of pressure to said stack, said one coating of said one sheet is forced into said reactive contact with said one coating of the second sheet to thereby produce a colored mark,

said sheets being capable of rearrangement such that said one sheet overlies said second sheet with its other coating disposed against the other coating of the second sheet, whereby upon application of pressure to said stack said other coating of said one sheet is forced into said reactive contact with said other coating of the second sheet to thereby produce another colored mark.

PATENTS

GRANTED JUL. 3, 1979

ERRATA

For CLASS	See PATENT NO.
405–174	4,159,630
414–460	4,159,778
435–015	4,159,923
252–356	4,159,952
250–540	4,159,971
525–091	4,159,975
525–441	4,159,978
568–576	4,160,000
525–230	4,160,001
424–048	4,160,054
542–426	4,160,095
364–400	4,160,271
364–602	4,160,272
364–900	4,160,273
365–002	4,160,274
365–149	4,160,275

PATENTS

GRANTED JUL. 3, 1979

PRINTED

PATENTS

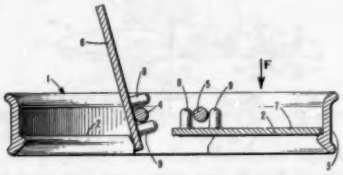
GRANTED JULY 3, 1979

GENERAL AND MECHANICAL

4,159,542
TIE HOLDER
Harold T. Pehr, 3920 W. 96th St., Overland Park, Kans. 66207
Filed Feb. 28, 1978, Ser. No. 882,620
Int. Cl.[2] A41D *25/08*
U.S. Cl. 2—152 R **8 Claims**

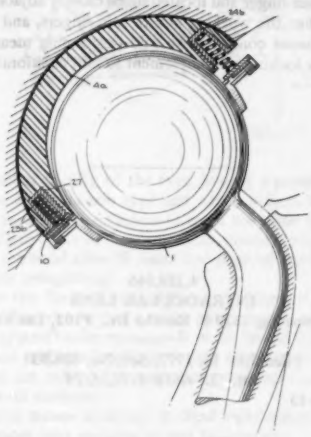
1. A tie holder for supporting a necktie adjacent to the front of a closed shirt collar, said tie holder comprising:
(a) a plate member having front and back surfaces, top and bottom edges, and opposing side edges;
(b) grasping members connected with said back surface and including a resilient hook member having first and second side edges, and first and second outwardly projecting lug members positioned adjacent to the first and second hook member side edges respectively; said first and second lug members cooperating with said hook member to form mutually engageable members for detachably connecting said plate member to said closed shirt collar;
(c) receiving means connected with said plate member for engaging and supporting a necktie thereon and positioning said necktie adjacent said closed shirt collar, said receiving means including at least two movable arm members each having opposite end portions thereof detachably connected to said plate member adjacent to said side edges, and extending transversely thereacross;
(d) said movable arm opposite end portions each being connectible to said plate member by fastener means; and
(e) said fastener means including a locking snap having a protuberance and an opening engageable with said protuberance.

4,159,543
HEART VALVE PROSTHESIS
Alain Carpentier, 96, rue Didot, 75 - Paris 14eme, France
Filed Nov. 11, 1976, Ser. No. 740,879
Claims priority, application France, Nov. 19, 1975, 75 36074
Int. Cl.[2] A61F *1/22*
U.S. Cl. 3—1.5 **3 Claims**



1. A heart valve comprising:
(a) a substantially circular ring having at least one seat and known types of suture means, and
(b) two substantially semicircular movable flaps adapted to rest on the said seat, comprising means permitting the said flaps to undergo movements of rotation through an angle less than 90°, as well as of translation, the said flaps being adapted to swing, each through an angle of less than 90°, between the said seat and two substantially parallel and transverse shafts serving as stops and limiting the displacements of the said flaps in rotation and in translation, the said shafts being constituted by cylindrical rods which are parallel and each having a fixed position with respect to the ring, the said rods cooperating with pegs disposed on the same face of the said flaps with respect to the said rods.

4,159,544
HIP JOINT PROSTHESIS
Zafer A. Termanini, Brooklyn, N.Y., assignor to Zafmedico Corporation, Brooklyn, N.Y.
Filed Nov. 28, 1977, Ser. No. 855,336
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.912 **8 Claims**



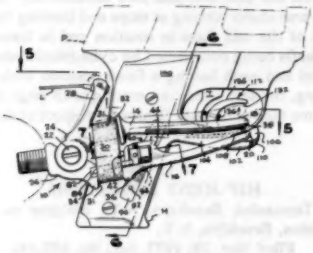
1. In a hip joint prosthesis of the type having separate ball and socket members for being implanted respectively in femoral and acetabular openings, the improvement wherein the socket member comprises:
means providing a cup-shaped bearing surface for the ball member;
means for retaining the ball member in an assembled position within the socket member; and
spring means connected between said cup-shaped bearing surface means and said ball member retaining means for absorbing forces applied in a direction tending to separate the assembled ball and socket members.

4,159,545
WORKING ARTIFICIAL HAND COMBINATION
Willie D. Manning, Bradford, and Jerry Whitehead, Trenton, both of Tenn., assignors to M-W Handicapped Enterprises, Inc., Trenton, Tenn.
Filed Sep. 26, 1977, Ser. No. 836,651
Int. Cl.[2] A61F *1/06*
U.S. Cl. 3—12.8 **66 Claims**

1. In an artificial hand for operation of various implements such as tools and useful devices and the like, having a pair of fingers including facing gripping surfaces extending from a pivot for movement into and out of engagement, tensioning means engaging the fingers to urge movement of the fingers

toward such engagement, means selectively operated by the wearer to open and close the fingers, the improvement comprising,

positioning means in the form of an opening having slide means connected there to for slidably receiving said implement,



said positioning means being secured to one of the fingers to hold the implement in preselected position independent of said other finger and located more closely adjacent to said pivot than the working end of said fingers, and

locking means connected to said positioning means for releasably locking said implement to said positioning means.

4,159,546

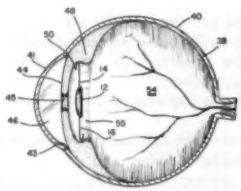
INTRAOCULAR LENS

Steven P. Shearing, 2320 S. Rancho Dr., #103, Las Vegas, Nev. 89102

Filed Jun. 15, 1977, Ser. No. 806,957

Int. Cl.[2] A61F *1/16, 1/24*

U.S. Cl. 3—13 **4 Claims**



2. In cataract surgery following capsular extraction, a method of implanting an intraocular lens having a plastic lens body and first and second flexible and memory retaining curved looped strands wherein one end of each strand is secured adjacent the peripheral edge of said lens body and the other end is unsecured, comprising inserting said lens through the pupil with said first strand first followed by said lens body, directing said first strand into the posterior chamber, further urging said lens through the pupil and into the posterior chamber thereby compressing said first strand within the posterior chamber until said second strand passes through said pupil and into the posterior chamber, and directing said second strand opposite said first strand in the posterior chamber, whereby the entire lens is located and fixed within the posterior chamber and posterior to the iris.

4,159,547

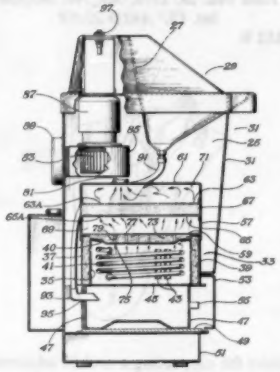
INCINERATOR URINAL

Ernest B. Blankenship, Dallas, Tex., assignor to Research Products/Blankenship Corporation, Dallas, Tex.

Filed Dec. 7, 1977, Ser. No. 858,185

Int. Cl.[2] A47K *11/02*

U.S. Cl. 4—111.1 **9 Claims**



1. An incinerator urinal, comprising:

a housing,

incinerator chamber means located in said housing,

bowl means located above said incinerator chamber means for receiving liquid effluent,

pan means adapted to be located below said incinerator chamber means and in fluid communication with said incinerator chamber means,

a drain tube located exteriorly at said incinerator chamber means and extending from the lower end of said bowl means to said pan means exteriorly of said incinerator chamber means for allowing the flow of liquid effluent from said bowl means to said pan means,

heater means for applying heat to the effluent deposited in said pan means, and

a heat activated catalyst for reducing the odor of said effluent during operation of said heater means.

4,159,548

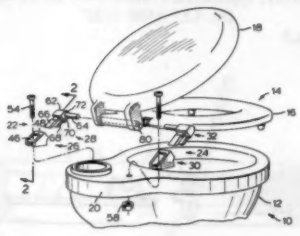
LIFT-OFF HINGE ASSEMBLY FOR TOILETS AND THE LIKE

Clifford B. Hewson, Toronto, Canada, assignor to Moldex Limited, Barrie, Canada

Filed Feb. 15, 1978, Ser. No. 878,043

Int. Cl.[2] A47K *13/12;* **E05D** *7/12*

U.S. Cl. 4—236 **8 Claims**



1. A hinge assembly for use in releasably and pivotally connecting a toilet seat or lid to a toilet, comprising:

(a) a lift-off hinge pin having

(i) a head portion having a base surface and a side surface,

(ii) a clip portion extending from the base surface of the

head portion and consisting of a flexible first jaw member having an outwardly-facing surface and a second jaw member having an oppositely outwardly-facing surface spaced from the outwardly-facing surface of the first jaw member, the first jaw member having a notch extending laterally across its outwardly-facing surface, and

(iii) a pin portion extending from the side surface of the head portion and adapted to pivotally mate with a toilet seat or lid, and

(b) a hinge block securable to a toilet, the hinge block having

(i) a hollow interior,

(ii) a substantially flat lower exterior surface for contacting said toilet when said hinge block is secured to said toilet

(iii) a pair of solid walls extending upwardly and forwardly from said substantially flat lower surface,

(iv) a first side facing upwardly and forwardly adapted to be brought into proximity with the base surface of said hinge pin, the said side having an entry opening permitting access to the interior and adapted to snugly receive the jaw members of the hinge pin,

(v) a second side facing upwardly and rearwardly having a release opening permitting access to substantially the entire interior of said hinge block for cleaning purposes, and a bridge portion separating the entry opening of the said first side from the release opening in the said second side, the bridge portion defining a retaining member, so that, when the jaw members of the hinge pin are snugly received by the entry opening of the hinge block, the notch on the outwardly facing surface of the first jaw member engages the retaining member to mate the hinge pin to the hinge block, the outwardly facing surface of the first jaw member then being accessible through the release opening so that, upon the inward deflection of the first jaw member towards the second jaw member, the notch is released from engagement with the retaining member, thereby allowing the hinge pin to be removed from the hinge block, and

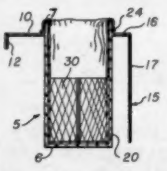
(vi) the first jaw member being dimensioned to close substantially entirely the release opening when the hinge pin is mated with the hinge block.

4,159,549

CUSPIDOR

Guy V. Layton, Jr., 2230 4th St., Port Neches, Tex. 77651

Filed Jan. 26, 1977, Ser. No. 762,506
Int. Cl.[2] A61J *19/00*
U.S. Cl. 4—285 **1 Claim**



1. A cuspidor comprising:

a. a hollow cylindrical member having a lower closed end and an open upper end;

b. a lateral projection extending therefrom adjacent, but spaced from said open upper end of said member, said projection having a longitudinal extension on the end thereof;

c. handle means on said member comprising a lateral projection and a longitudinal extension;

d. a plastic liner for said member having one end closed and one end open, with the open end of said liner extending over said open end on said member, and having means for sealing said liner; and

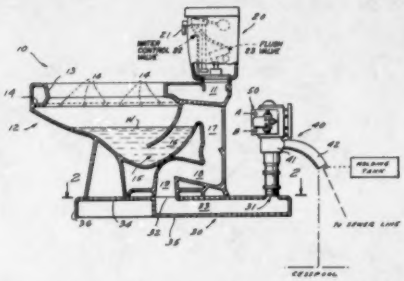
e. a cylindrical body of honeycomb type cellular paper material conforming with and contained in said hollow member with said body of cellular material being positioned adjacent said lower closed end of said member and filling approximately one-half of said hollow member.

4,159,550

TOILET FACILITY

Leo W. Tobin, Jr., Darien, Conn., assignor to American Standard Inc., New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,495
Int. Cl.[2] E03D *1/00, 3/00*
U.S. Cl. 4—319 **6 Claims**



1. In a toilet facility of the type having a modified water closet bowl of the siphon type and which utilizes a minimum amount of flush water sufficient to wash the water closet bowl after each flush cycle so that only clean, uncontaminated water remains in the bowl after all waste is evacuated therefrom, said toilet facility comprising:

a hollow rim formed around the upper edge of said bowl, said hollow rim having a water inlet opening and a plurality of spaced outlet openings formed therein and disposed adjacent said bowl surfaces so that all water entering said hollow rim will pass through said outlet openings to wash said bowl surfaces;

flush valve means mounted in fluid tight connection with said water inlet opening of said hollow rim;

said bowl including an integrally formed up-leg having a bowl waste inlet opening and a down-leg having a bowl waste outlet opening so as to define a bowl waste passageway of the siphon type;

a sump tank having a waste passageway therein and waste inlet and waste outlet openings formed at each end respectively of said passageway;

said bowl mounted on said sump tank in fluid tight connection with said sump waste inlet opening and said bowl waste outlet opening so that said bowl waste passageway and said sump waste passageway are in fluid communication to provide a continuous waste passageway;

a macerator pump mounted on said sump tank in fluid tight connection with said sump waste outlet opening, said macerator pump having waste inlet and outlet openings;

actuating means operatively connected to said flush valve means for opening said flush valve to permit water to enter said hollow rim through said water inlet opening;

a control circuit including flush cycle control means electrically connected to said valve actuator means and said macerator pump so that when said flush valve is opened by said actuator means to permit water to enter said hollow rim through said water inlet opening, said flush cycle control means is electrically energized and simultaneously electrically energizes said macerator pump to pump waste rapidly from said bowl without siphonic action and is electrically deenergized when waste is removed from said bowl whereby a minimum of flush water of less than one

gallon is utilized and is sufficient to wash the water closet bowl of waste so that only clean uncontaminated water remains in said bowl and provides a water seal when the flush cycle is completed, said control circuit including sensing means operably associated with said pump for shutting off said pump when only air is being pumped therethrough.

4,159,551

SEPARABLE BOAT

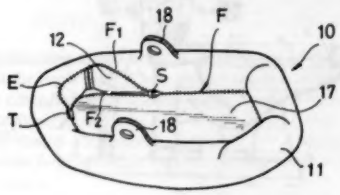
Kazuo Iwai, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1977, Ser. No. 824,814

Claims priority, application Japan, Aug. 17, 1976, 51/109788[U]

Int. Cl.² B63B 7/00

U.S. Cl. 9—2 A **5 Claims**



1. A boat which comprises a plurality of floatable units disposed endwise in relation to one another about a closed path; a plurality of slide fasteners each releasably connecting together, at respective end portions, a pair of corresponding adjoining floatable units to define with said plurality of floatable units an annular floatable member; a cover having peripheral portions disposed to embrace said annular floatable member; a slide fastener extending along said closed path and operable to releasably connect said peripheral portions together to secure the cover to the annular floatable member with said peripheral portions of the cover embracing the annular floatable member, said peripheral portions of the cover, when connected together by said slide fastener along said closed path, defining a hollow casing for receiving therein said annular floatable member.

4,159,552

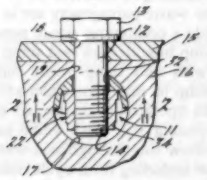
METHOD OF MANUFACTURING A BARREL NUT

Imre Berecz, Dana Point, Calif., assignor to Microdot Inc., Greenwich, Conn.

Division of Ser. No. 772,128, Feb. 25, 1977, Pat. No. 4,119,130. This application Jul. 10, 1978, Ser. No. 923,188

Int. Cl.² B21K 1/68, 1/70

U.S. Cl. 10—86 F **1 Claim**



1. A method of manufacturing a barrel nut comprising the steps of forming a cylindrical slug of metal, reforming said slug in a closed die by striking said slug in a radial direction thereby to form a semi-cylindrical barrel having a convex side and a recessed side, the recess having a flat bottom and radially extending side walls and end walls thereby to define a rectangular recess, drilling a bolt receiving aperture centrally of said recess bottom and normal thereto and through the convex surface of said barrel element, forming ear-receiving apertures at opposite ends of opposite side walls of said recess, forming a nut element having a rectangular base and a tubular threaded portion extending upwardly therefrom, forming ears on the opposite side edges of said nut element base, placing said nut element base in said barrel element recess so that said ears are aligned with said recess side wall apertures, and forcing said opposite ends of the side walls toward said nut element base so that said ears at least partially enter said apertures.

4,159,553

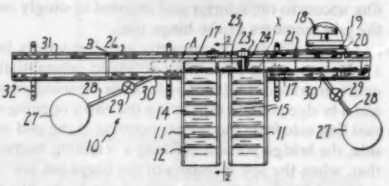
CONTINUOUS PROCESS FOR DECONTAMINATING AND CLEANING THE OUTER SURFACE OF PLASTIC CONTAINERS TO PERMIT PRINTING THEREON

Sinibaldo Graziano, 516 Front St., Union Beach, N.J. 07735

Filed Aug. 24, 1977, Ser. No. 827,121

Int. Cl.² B67C 1/00

U.S. Cl. 15—101 **3 Claims**



1. A round container continuously operated cleaning and decontaminating machine, comprised of a gravity feed trough designed to retain a plurality of particularly sized containers in aligned abutting rolling relationship, said gravity feed trough connected to an abutting level extended carrier trough at its lower exit, said abutting and level extended carrier trough being of a round shape with a feed portion to accept said containers one by one, a cyclely operated pusher piston fitted to said carrier trough to move said containers one at a time to the left the length of said container to thus permit the next container to drop into said carrier trough when the piston retracts in its cycled continuous operation, said containers pushed outward from said initially charged position along said carrier trough, said carrier trough lined along a portion of its length with an absorbent resilent material such as toweling, said lined trough divided into two separated portions, a first portion being positioned adjacent said feed trough, a tank containing a cleaning solution such as alcohol connected to the first portion of said lined trough with a gravity feed and having a valve to control the fluid flow, a second portion of said lined trough separated from said first portion and provided with a dry absorbent material to wipe said containers clean and dry, said containers being ejected from the end of said trough by the movement of the pusher piston.

4,159,554

FABRIC CLEANING HAND TOOL WITH RECIRCULATING SYSTEM

Arlen M. Knight, 1141 N. Patterson, and William R. Hachtmann, 5072 Walnut Park Dr., both of Santa Barbara, Calif. 93111

Filed May 6, 1977, Ser. No. 794,353

Int. Cl.² A47L 7/00, 11/34

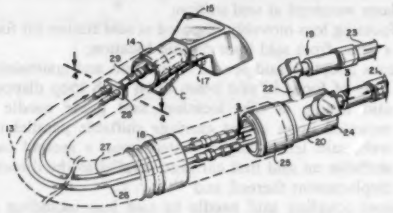
U.S. Cl. 15—321 **3 Claims**

1. A fabric cleaning hand tool with a recirculating system for use with a cleaning machine including a recovery tank, a heated fluid solution dispensing tank and a pump having an inlet and outlet in said dispensing tank for recirculating fluid solution, comprising, in combination:

(a) a hand-held head structure defining in its interior a suction chamber and an adjacent spray nozzle;

(b) a vacuum hose having one end connected to said head in communication with said suction chamber and its other end extending to said recovery tank;

(c) a dispensing fluid inlet line connecting to the outlet of said pump in said fluid solution dispensing tank and a fluid outlet line connecting to the inlet of said pump to return said fluid solution to said dispensing tank so that fluid is circulated by said pump in said tank; and,



(d) a member secured to said head connecting to said fluid inlet line and said fluid outlet line and to said spray nozzle so that a portion of heated fluid passing through said fluid inlet line is continuously recirculated back through said member and said fluid outlet line to said fluid dispensing tank and another portion is passed to said nozzle, when said nozzle is operated whereby the portion of fluid passed to said nozzle is maintained in a heated state as a consequence of the recirculation of the said first mentioned portion of fluid.

4,159,555

SOIL-RELEASING ROLLER FOR WET OR DRY CARPET-CLEANING APPARATUS

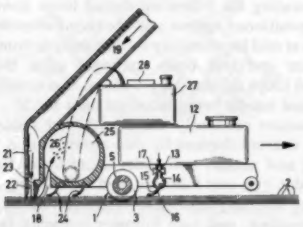
Helmut Schneider, Mainz, Fed. Rep. of Germany, assignor to Werner & Mertz GmbH, Mainz, Fed. Rep. of Germany

Filed Nov. 18, 1977, Ser. No. 852,725

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1976, 2652894; Feb. 28, 1977, 2708681; Sep. 8, 1977, 2740360

Int. Cl.[2] A47L *5/30*

U.S. Cl. 15—366 **14 Claims**



1. A rapid-rotation soil-loosening roller for a carpet-cleaning machine comprising:

an elongated body of shape-retentive material having an axis and a multiplicity of annular projections with continuous peripheries of circular outline in projection on a plane perpendicular to said axis, the periphery of each projection having at least two points of maximum excursion angularly offset from one another about said axis and lying on opposite sides of a median plane therebetween perpendicular to said axis, the periphery of each projection undergoing axial excursion with respect to the carpet upon rotation of said body about said axis, said projections having oppositely facing cheeks lying at right angles to said axis and defining annular grooves between said projections, said projections being angularly offset from one another along the length of the roller with the maximum excursion points of successive projections being angularly offset from each other so that the net axial reaction force on said roller when said roller is rotated in contact with the pile of a carpet because of opposite deflection of said pile is zero.

4,159,556

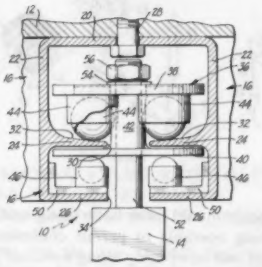
SUSPENSION SYSTEM PRIMARILY DESIGNED FOR USE WITH OPERABLE WALLS AND PARTITIONS

Wesley B. Dickson, Brea, Calif., assignor to Advanced Equipment Corporation, Anaheim, Calif.

Filed May 30, 1978, Ser. No. 910,605

Int. Cl.[2] A47H *13/00*

U.S. Cl. 16—87.4 R **6 Claims**



1. A suspension system including an elongated track system having a junction between individual tracks and a trolley supported by said track system, said trolley being movable along the length of said tracks and from one track to another at said junction in which the improvement comprises:

said trolley including a first plate, a second plate, connecting means connecting said plates so as to position said plates so that they are parallel to and spaced from one another, and a plurality of downwardly extending spherical bearings mounted on the undersurface of said first plate,

each of said tracks including two normally used flanges located in the same plane and holding means connecting said normally used flanges for holding said flanges so that they are spaced apart to define a slot extending between said flanges and so that said flanges are parallel and in the same plane,

said flanges of all of said tracks being located in the same plane,

at least one of said downwardly extending spherical bearings resting on each of said flanges of one of said tracks with the connecting means extending through said slot of said one of said tracks when said trolley is not located at said junction,

an upwardly extending spherical bearing located adjacent to each of said flanges of each of said tracks adjacent to said junction, and

mounting means connecting said upwardly extending spherical bearings with said tracks in positions in which said upwardly extending spherical bearings will engage said second plate so as to support said trolley as said trolley is moved across said junction.

4,159,557

CABINET HINGE

Willi Pittasch, and Johannes Dalbert, both of Herford, Fed. Rep. of Germany, assignors to Firma Richard Heinze, Westfalen, Fed. Rep. of Germany

Filed Oct. 20, 1977, Ser. No. 844,118

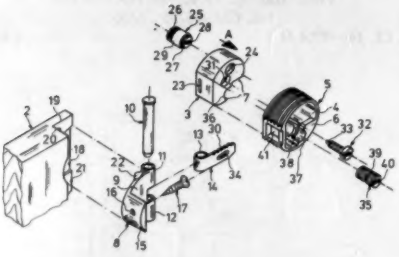
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647776; Oct. 23, 1976, 2648095

Int. Cl.[2] E05D *5/02, 7/04*

U.S. Cl. 16—129 **21 Claims**

1. A hinge for articulated connection of two furniture components, said hinge comprising first and second hinge parts,

said first hinge part comprising an outer anchoring sleeve operable to secure said first hinge part in a recess in a first of said components and an inner body disposed in said sleeve, and said second hinge part comprising means operable to secure said second hinge part to the second of said components and a pivotally mounted hinge arm, said outer sleeve of said first hinge part having a first opening operable to receive said inner body for selective positioning along a first axis which axis is perpendicular to the surface of said first component, means



operable to position said inner body along said first axis and a second opening operable to permit communication of said hinge arm and said inner body along a second axis which axis is parallel to the surface of said first component, and said first hinge part inner body comprising a base and a slide, said inner body having means operable to receive said hinge arm for selective positioning along said second axis and means operable to position said hinge arm in said inner body along said second axis, said slide being displaceable relative to said base along a third axis perpendicular to both of said first and second axes.

4,159,558

APPARATUS FOR THE CUTTING OF COLUMNS OF THREAD LOOPS

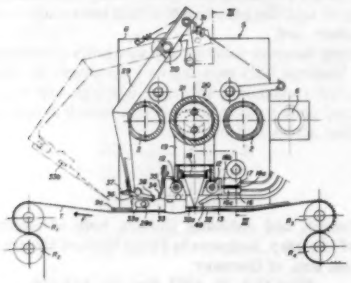
Gerard Durville, Le Lignon; Michel Moulin, Lausanne; Serge Ramseier, Carouge, and Erwin Zurcher, Le Lignon, all of Switzerland, assignors to Cotonificio Cantoni S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 836,094, Sep. 23, 1977, abandoned, which is a continuation of Ser. No. 641,365, Dec. 17, 1975, abandoned. This application Oct. 21, 1977, Ser. No. 844,278

Claims priority, application Switzerland, Dec. 24, 1974, 17270/74; Oct. 22, 1976, 13365/76

Int. Cl.[2] D06C *13/08, 13/10*

U.S. Cl. 26—10 R **9 Claims**



1. An apparatus for the manufacture of a pile fabric by severing thread loops disposed parallel to one another in successive columns along one surface of a fabric web, said apparatus comprising:

means forming a cutting station and defining a cutting location;

means for relatively displacing said station and said web to advance the thread loops of each column successively to said location and displace the respective column past said location;

a guide needle engaged in the column of thread loops advanced toward said location and supporting each thread loop at said location;

a laser mounted at said station;

a focusing lens movably disposed at said station for focusing a beam from said laser on said location;

means coupling said needle to said lens and maintaining the zone of focus in said beam upon each loop disposed on said needle at said location, said guide needle being mounted upon a first carriage shiftable parallel to said web, said lens being mounted upon a second carriage shiftable on said first carriage parallel to the direction of displacement thereof; and

means coupling said needle to said lens including means responsive to the movement of said second carriage for controlling the displacement of said first carraige.

7. An apparatus for the manufacture of a pile fabric by severing thread loops disposed parallel to one another in successive columns along one surface of a fabric web, said apparatus comprising:

means forming a cutting station and defining a cutting location;

means for relatively displacing said station and said web to advance the thread loops of each column successively to said location and displace the respective column past said location;

a guide needle engaged in the column of thread loops advanced toward said location and supporting each thread loop at said location;

a laser mounted at said station;

a focusing lens movably disposed at said station for focusing a beam from said laser on said location;

means coupling said needle to said lens and maintaining the zone of focus in said beam upon each loop disposed on said needle at said location, said needle being provided with a hook portion at said location defining an abutment engageable by each thread loop and an inclined flank accelerating the following thread loops toward a thread loop positioned against said abutment whereby the thread loops at said locations are substantially in contact with one another and said beam impinges upon the successive thread loops substantially without encountering said needle, said needle being mounted on a slider;

spring means resiliently bearing on said slider against the force exerted thereon by movement of said thread loops along said needle, said slider being formed as a cam engageable by a cam follower, said slider being connected to an arm normally latched to retain said needle in its operative position, said cam follower releasing said arm upon operation by said cam, said cam follower being provided on a lever; and

electromagnetic means responsive to the reflection of light from said needle and the absence of a thread loop at said location for displacing said lever to unlatch said arm.

4,159,559

METHOD OF MAKING PLASTIC EL LAMP

Thomas L. Robinson, Sr., East Aurora, N.Y., assignor to T. L. Robinson Co., Inc., E. Aurora, N.Y.

Filed Feb. 19, 1976, Ser. No. 659,411

Int. Cl.[2] H01J *9/12*

U.S. Cl. 29—25.14 **11 Claims**

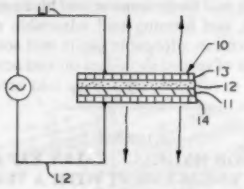
1. A method of making flexible electroluminescent lamps, comprising

applying an electroluminescent phosphor formulation to one side of a flat, dielectric, transparent film substrate to form thereon an electrically excitable EL layer,

coating said EL layer and the opposite side of said substrate with an indium oxide formulation,

curing the coating to cause it to form translucent, electrically-conductive films over said EL layer and said opposite side of said substrate, respectively,

attaching one end of each of a pair of electrical leads to a different one of said electrically-conductive films, so that



the other end of each lead projects beyond said substrate, and

sealing the coated substrate in a transparent plastic jacket with said one end of each lead in electrical contact with the respective film to which it is attached, and with said other ends of said leads projecting from said jacket for connection to a voltage supply.

4,159,560

EQUIPMENT FOR EXTRUSION IN PARTICULAR FOR THE EXTRUSION OF ALUMINUM BILLETS INTO SECTIONS AND THE LIKE

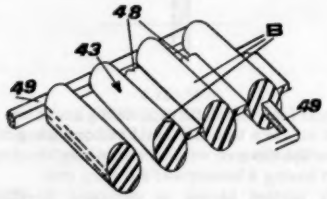
Alfred Wagner, Steisslingen, Fed. Rep. of Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Oct. 15, 1976, Ser. No. 732,955

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1975, 2547067

Int. Cl.[2] B21C *23/21, 33/00, 35/04*

U.S. Cl. 29—33 C **14 Claims**



1. A machine for extruding billets, in particular aluminum billets, comprising in combination:

a split container having first and second parts and movable between open and closed positions, a central axis,

billet-feeding means disposed laterally of said container, the billets being disposed substantially parallel to said central axis, said first part being eccentrically and unyieldingly pivotably hinged to said second part and disposed substantially parallel to said container central axis, one of said parts being stationary, the other of said parts being movable from a loading position to a passage-forming position, the container being in said open position in said loading position, and being substantially in said closed position and formed with an extrusion passage in said passage-forming position, the billets being loadable into said container in the open position by said billet-feeding means,

a press ram, passable through said passage,

closure means for pressing said first part against said second part for moving said container into said closed position, and

further comprising a plurality of molds disposed upstream of said feeding means for molding the billets, a casting furnace disposed upstream of said molds for furnishing molten material to said molds, cutting means disposed downstream of said container for cutting the extruded billets, there being operatively produced billet chips by said cutting means, a baling press cooperating with said sawing means for processing the chips, and conveyor means interconnected between said baling press and said casting furnace for returning the processed chips to said casting furnace.

4,159,561

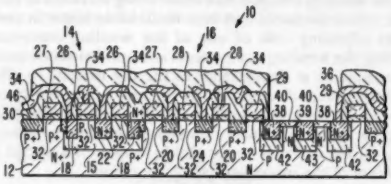
METHOD OF MAKING A SUBSTRATE CONTACT FOR AN INTEGRATED CIRCUIT

Andrew G. F. Dingwall, Bridgewater, N.J., assignor to RCA Corp., New York, N.Y.

Division of Ser. No. 786,246, Apr. 11, 1977, Pat. No. 4,081,896. This application Dec. 19, 1977, Ser. No. 862,530

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—571 **2 Claims**



1. An improved method for altering the threshold voltage characteristics of individual, isolated silicon gate IGFETs comprising the steps of:

(a) forming a plurality of IGFETs having silicon gates on a single substrate;

(b) forming metal contacts to said IGFETs, said metal contacts not overlying the gates of selected ones of said IGFETs;

(c) forming a protective oxide layer over said IGFETs and over said metal contacts;

wherein the improvement comprises:

(a) photolithographically defining an etch resistant mask through which are exposed the portions of said protective oxide layer which overlie:

(i) selected portions of said metal contacts, which selected portions of said metal contacts are used as bond pads; and

(ii) selected ones of said silicon gates, which selected ones of said silicon gates are the individual, isolated silicon gate IGFETs whose threshold voltage characteristics are to be modified;

(b) removing said exposed portions of said protective oxide layer by etching, thereby exposing said selected portions of said metal contacts and the silicon gates of said selected ones of said IGFETs; then

(c) ion implanting selected conductivity modifiers through said selected isolated silicon gates, through the underlying gate insulator and into the channel region of the selected IGFETs, thereby modifying the threshold voltage characteristics of said selected IGFETs.

4,159,562

METHOD FOR SECURING WINDING COMPONENTS IN THE SLOT OF A ROTARY ELECTRIC MACHINE

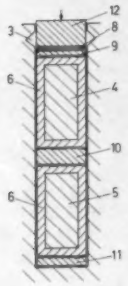
Gabor Liptak, Baden, and Roland Schuler, Wettingen, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Oct. 12, 1977, Ser. No. 841,474

Claims priority, application Switzerland, Nov. 17, 1976, 14458/76

Int. Cl.[2] H02K *15/06*

U.S. Cl. 29—596 **21 Claims**



1. The method of securing insulated winding components in the slots of a rotary electrical machine against displacement which includes the steps of substantially filling the slot with the insulated winding components, there being included in the slot at least one deformable and heat-hardenable insert in contact with an adjoining side of one of the winding components, subjecting the winding components and non-hardened insert to pressure applied at the entrance of the slot thereby to effect a deformation thereof to match any tolerance irregularity in the profile of the adjacent surface of the winding component, heating the insert while under pressure to harden the same, and closing off the entrance to the slot by means of a wedge after completion of the insert hardening operation.

4,159,563

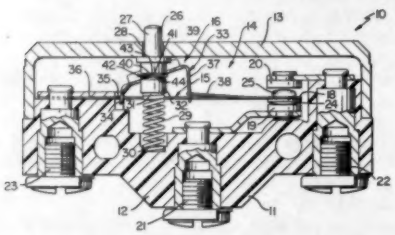
ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

Werner R. Bauer, Radnor, and William N. Smith, Hatboro, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 707,635, Jul. 22, 1976, Pat. No. 4,109,121. This application Feb. 9, 1978, Ser. No. 876,479

Int. Cl.[2] H01H *11/00*

U.S. Cl. 29—622 **11 Claims**



1. A method of making an electrical switch construction comprising the steps of forming a housing means to carry a pair of spaced contact stops and a snap switch blade having a contact portion for being snapped between said stops when said blade is moved overcenter, forming a movable actuator means to be carried by said housing means for moving said blade overcenter in one direction when said actuator means is moved in one direction thereof and for moving said blade overcenter in the opposite direction when said actuator means is moved in the opposite direction thereof, forming said actuator means with an adjustable means for adjusting the movement differential of said actuator means without adjusting the air gap between said control stops, forming part of said actuator means with an actuator plunger, forming part of said actuator means with an actuator spring that is moved by movement of said actuator plunger, operatively interconnecting said actuator spring to said blade to move said blade as said actuator spring is moved, and forming said adjustable means of said actuator means with an adjustable gap in said actuator plunger that defines a pair of spaced shoulders on said actuator plunger that are adapted to respectively engage said actuator spring.

4,159,564

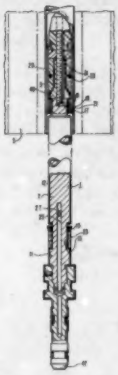
MANDREL FOR HYDRAULICALLY EXPANDING A TUBE INTO ENGAGEMENT WITH A TUBESHEET

Frank W. Cooper, Jr., Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1978, Ser. No. 896,532

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—727 **18 Claims**



1. A mandrel for hydraulically expanding a tube into engagement with a hole in a tubesheet, said mandrel comprising:

a body portion covered with an electrically isolating material and having a leading and a trailing end;

said body portion having an elongated circumferential groove disposed in each of said ends;

an elastomer sealing member disposed in each of said grooves;

an elastomer back-up member disposed in each of said grooves outboard of said sealing members; and

means disposed in said trailing end for introducing pressurized fluid between said grooves whereby the pressurized fluid hydraulically expands that portion of the tube between the seals into engagement with the tubesheet.

4,159,565

COVER AND STRAIN RELIEF APPLICATOR APPARATUS

Glendon H. Schwalm, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

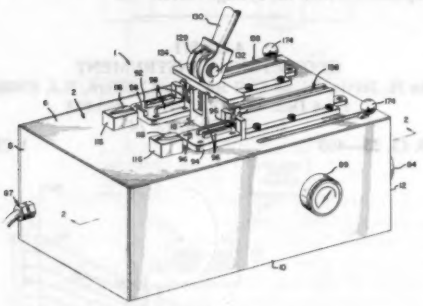
Filed May 8, 1978, Ser. No. 904,082

Int. Cl.[2] H01R *43/00*

U.S. Cl. 29—759 **2 Claims**

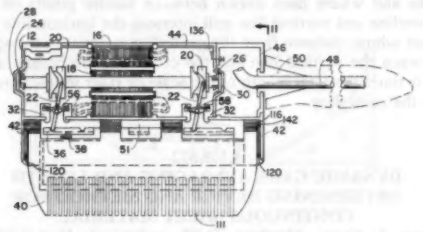
1. Apparatus for assembling a cover and strain relief clip to a multiconductor cable having the individual conductors thereof terminated with a multicontact connector, comprising:

a housing,
a work station on said housing,
a magazine on said housing for supplying serially a plurality of strain relief clips to said work station,
a ram internally of said housing and reciprocating from said housing to said work station,
a support tower from the floor of said housing to said work station and supporting said ram,
a fixture on said housing for positioning a multicontact connector at said work station,



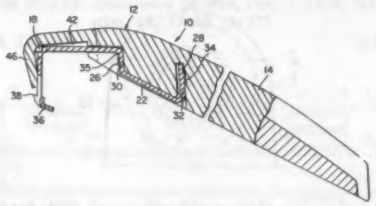
a boss projecting from said housing and in alignment with said fixture for aligning and slidably guiding a cover first along said boss and then a slidable assembly on said connector,
said tower extending outwardly of said housing beyond said work station and supporting a pressure platen,
first means on said tower for actuating said platen toward a work station to clamp a multicontact connector in position at said work station, and
second means for slidably actuating said ram to engage and insert a clip into a cover positioned and clamped at said work station together with said connector.

4,159,566
ELECTRIC RAZORCOMB
Raymond A. Patrin, GPO Box 731, New York, N.Y. 10001
Filed Apr. 5, 1976, Ser. No. 673,817
Int. Cl.[2] B26B *21/12*
U.S. Cl. 30—30 **12 Claims**



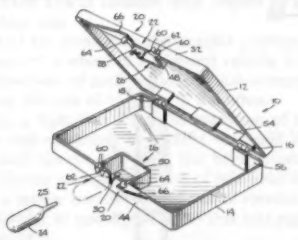
1. An electric razorcomb, comprising:
a housing,
a comb removeably secured in the slot of the housing,
a slot formed in an inner portion of the comb,
a razor mounted in the slot of the comb, said comb secured by magnetic means in the housing and
means attached to the housing and connected to the razor to move the razor within the slot in the comb, whereby the razor comb may cut hair from an individual.

4,159,567
SHAVING INSTRUMENT
Evan N. Chen, Fairfield, and Peter Bowman, Sandy Hook, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Aug. 1, 1977, Ser. No. 820,503
Int. Cl.[2] B26B *21/24*
U.S. Cl. 30—62 **9 Claims**



1. An injector razor comprising:
a molded main frame having a handle;
an integral resilient blade seat having a tail section secured to said main frame and a pivotable blade rest portion for selectively receiving and clamping a shaving blade against said main frame, said main frame being recessed and said tail section including a pair of laterally oppositely extending lugs adjacent said pivotable blade rest portion, said lugs being set into slots provided in said recessed under portion of said main frame and establishing along a line extending therebetween, a position about which said blade rest portion of said blade seat may be pivoted for receiving and clamping said blade against said main frame.

4,159,568
CAPSULE BOX
Howard E. Berner, Summit, N.J., assignor to Pharmacaps, Inc., Elizabeth, N.J.
Filed Feb. 22, 1978, Ser. No. 879,858
Int. Cl.[2] B25F *3/00*
U.S. Cl. 30—124 **11 Claims**



1. A container for holding elastic capsules and the like comprising a lower container portion and an upper container portion hingedly connected thereto, said container portions forming a first enclosure when hinged closed, a first cutting member secured to one of said upper and lower container portions and a second cutting member secured to the other of said upper and lower container portions, said cutting members having cooperating cutting surfaces which are adapted to cut an elastic capsule upon closure of said container portions and sever the elastic capsule into two parts, said cutting members including engaging means adapted to engage the elastic capsule during cutting to facilitate cutting and severing of the elastic capsule.

4,159,569

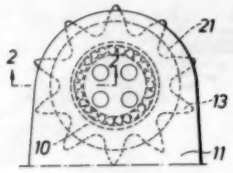
CHAIN SAW GUIDE BAR

Erik W. Sundstrom, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Continuation of Ser. No. 725,122, Sep. 20, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,605

Int. Cl.[2] B23D *57/02*

U.S. Cl. 30—384 **3 Claims**



1. In a chain saw of the type comprising a guide bar around which a saw chain is to travel, said guide bar including a pair of spaced side plates defining a nose portion at one end of said guide bar, and rotary support means mounted in said nose portion between said side plates for supporting the saw chain during travel around said nose portion, said rotary support means comprising:

a bearing center fastened to and between said side plates,

cylindrical roller bearing means disposed around an outer periphery of said bearing center,

a sprocket wheel journaled on said bearing means, and

a pair of flange plates attached to said bearing center and extending radially outwardly a distance sufficient to surround said bearing center, said bearing means, and an inner portion of said sprocket wheel so that said sprocket wheel, cylindrical roller bearing means, bearing center, and flange plates form a unit for removal from and insertion into said nose portion, the spacing between said flange plates being greater than the thickness of said sprocket wheel disposed therebetween to avoid interference with rotation of the sprocket wheel.

4,159,570

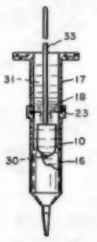
DISPOSABLE MIXING SYRINGE

Morris J. Baskas, New Rochelle, and Sidney I. Berger, New York, both of N.Y., assignors to Dentipressions Incorporated, New York, N.Y.

Filed Oct. 31, 1977, Ser. No. 847,270

Int. Cl.[2] A61C *7/00;* **A61M** *5/00;* **B65D** *25/08*

U.S. Cl. 32—66 **13 Claims**



1. A disposable syringe and mixing assembly comprising a syringe barrel of uniform inside diameter having an exiting orifice at one end and an opening at the opposite end, a diaphragm seated within said barrel and separating the interior of the barrel into a lower chamber at said one end and an upper chamber at the opposite end, a first component of a mixture to be formed within the lower chamber, a second component of the mixture to be formed within the upper chamber, said diaphragm being constituted wholly of thin flexible foil sheet material that is readily punctured but without fracturing into separate pieces, said barrel being divided into upper and lower parts joined at said diphragm location, one of said barrel parts having at the junction an annular groove, the other of said barrel parts having at the junction an annular projecting tongue fitted within and mating with said annular groove, said foil sheet being seated between the tongue and groove and being mechanically locked thereby into position within the barrel, and a removable closure at said opposite end of the barrel, removal of the closure allowing insertion of a mixing tool for puncturing of the diaphragm and mixing of the two components within the syringe barrel.

4,159,571

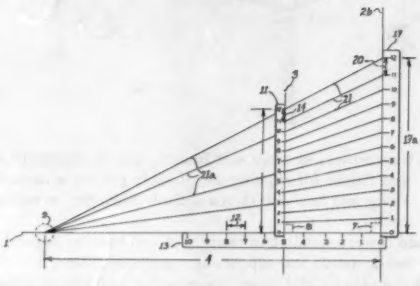
GEOMETRICAL INSTRUMENT

John H. Jervis, Jr., 48 Cliff Rd., West Milford, N.J. 07480

Filed Dec. 30, 1977, Ser. No. 865,842

Int. Cl.[2] B43L *13/14*

U.S. Cl. 33—403 **1 Claim**



1. A measuring device used to construct an accurate perspective drawing with as many vanishing points and from any viewpoint deemed necessary, without the actual use of vanishing points, said device having two scales thereon adjacent marginal edge portions thereof, the first being a height scale marked off in the same number of units similar to, but proportionately smaller than, a standard ruler or architect's scale used to graduate a centerline arranged perpendicular to a horizon line, said height scale having a total length which is a predetermined length shorter than the total length of the standard ruler, and the second being a distance scale marked off in units equal to the difference in length between the height scale and the total length of the standard ruler or architect's scale, whereby the height scale is used to calibrate a vertical line parallel to the centerline with the vertical line placed to the side of the centerline a distance determined by the distance scale and where lines drawn between similar points on the centerline and vertical line will intersect the horizon line at a point whose distance from the centerline is equal to the space between the vertical line and the centerline in distance scale units times the total length of the scale or ruler used to graduate the centerline.

4,159,572

DYNAMIC GAGE AVERAGING AND LENGTH DETERMINING DEVICE AND METHOD FOR CONTINUOUS SHEET MATERIAL

James A. Nunes, Martinez, Calif., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 2, 1977, Ser. No. 847,880

Int. Cl.[2] G01B *7/04;* **B21B** *37/02*

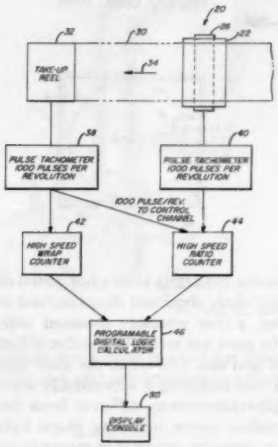
U.S. Cl. 33—142 **11 Claims**

1. A dynamic gage averaging apparatus for use in conjunction with continuous sheet material passing about a first rotatable roller of a known diameter to be subsequently wound upon a take-up reel, said gage averaging apparatus including:

means for measuring take-up reel angular velocity;

means for measuring the first roller angular velocity, said first roller's angular velocity being equal to the linear velocity of the sheet material being passed thereabout;

means for comparing the first roller velocity to the take-up reel velocity to determine a ratio therebetween for a given time period;


TAKE-UP REEL
PULSE TACHOMETER 1000 PULSES PER REVOLUTION
PULSE TACHOMETER 1000 PULSES PER REVOLUTION
1000 PULSE/REV. TO CONTROL CHANNEL
HIGH SPEED WRAP COUNTER
HIGH SPEED RATIO COUNTER
PROGRAMABLE DIGITAL LOGIC CALCULATOR
DISPLAY CONSOLE

means for measuring number of revolutions of the take-up reel for said given time period; and

means for automatically factoring the change in diameter of the coil on the take-up reel for said given time period by twice the number of revolutions of the take-up reel for obtaining the average gage of the product wound upon the take-up reel during said given period of time.

4,159,573

APPARATUS FOR MANUFACTURING THE PARTS OF ROTARY VESSELS

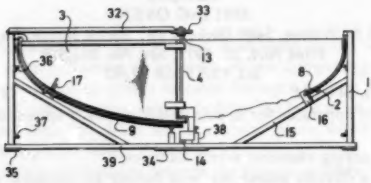
Karel Plihal, Brno, Czechoslovakia, assignor to Prvni Brnenska strojirna, narodni podnik, Brno, Czechoslovakia

Filed Mar. 29, 1978, Ser. No. 891,348

Claims priority, application Czechoslovakia, Mar. 31, 1977, 2136-77

Int. Cl.[2] G01B *3/14, 5/20;* **B23Q** *3/00*

U.S. Cl. 33—174 G **3 Claims**



1. An apparatus for manufacturing parts for cylindrical vessels comprising a supporting structure provided with adjustable bearings and stop elements for positioning preformed curved sections of sheet material, a template defining a profile corresponding to the desired shape of a portion of the cylindrical vessel pivotably and removably mounted on said structure by means of an axle, the angular positions of said template in relation to the supporting structure being adjustable by means of angular position indexing means carried by said supporting structure and said template.

4,159,574

METHOD OF MEASURING THE ANGULAR POSITION OF THE AXIS OF ROTATION OF A WHEEL

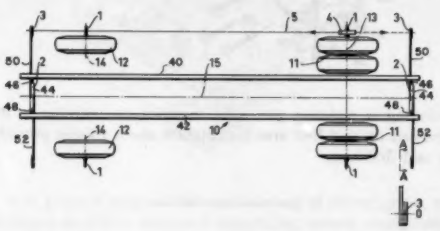
Erik Samuelsson, 6 Nygatan, Rättvik, Sweden (79500), and Jonas Samuelsson, 15 Syrénvägen, Örebro, Sweden (70220)

Continuation of Ser. No. 691,440, Jun. 1, 1976, abandoned, which is a continuation of Ser. No. 530,426, Dec. 6, 1974, abandoned. This application Mar. 21, 1978, Ser. No. 888,616

Claims priority, application Sweden, Dec. 7, 1973, 7316572

Int. Cl.[2] G01B *11/275*

U.S. Cl. 33—228 **6 Claims**



1. A method for measuring the angular position of a fixed axis of rotation of a wheel of a wheeled vehicle in relation to the longitudinal axis of such vehicle, which comprises:

determining the longitudinal axis of the vehicle:

determining the true axis of rotation of the wheel;

arranging a sight line across an extension of said axis of rotation so that the sight line and the axis of rotation form a right angle between each other, said sight line being placed substantially in a plane in common with said longitudinal axis of said vehicle;

establishing a first reference scale an arbitrary distance from said axis of rotation having a zero point a predetermined distance from said longitudinal axis;

establishing a second reference scale at another distance from said axis of rotation and having a zero point at the same predetermined distance from said longitudinal axis;

determining the amount the optical extension of said sight line varies from said zero point on said first scale;

determining the amount the optical extension of said sight line varies from said zero point on said second scale; and,

comparing said first scale zero-point variant to said second scale zero-point variant to determine the angular position of said fixed axis of rotation with respect to said vehicle longitudinal axis.

6. A method for measuring the angular position of a fixed axis of rotation of a wheel of a wheeled vehicle in relation to the longitudinal axis of such vehicle, which comprises:

determining the axis of rotation of the wheel;

establishing a sight line across an extension of said axis of rotation and extending in parallel with said longitudinal axis of said vehicle, said sight line being produced by an optical device arranged in front of said vehicle;

mounting a mirror parallel to said axis of rotation in a plane perpendicular to said sight line so that said sight line will be reflected;

determining the direction of said reflected sight line; and

determining the difference between the incident and reflected sight line.

4,159,575

SIGHTING DEVICE FOR ARCHERY BOWS

Philip Kalmbach, 921 Sixth Ave. N.E., Minot, N. Dak. 58701

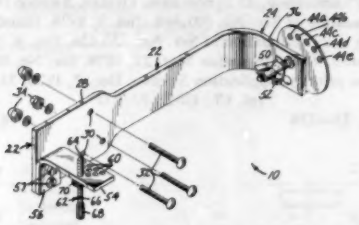
Filed Jun. 5, 1978, Ser. No. 912,411

Int. Cl.[2] F41G *1/46, 1/08*

U.S. Cl. 33—265 **9 Claims**

1. A sighting device for archery bows comprising an elongated body adapted to be attached intermediate its ends to one side of a bow, first and second arms extending laterally from

the opposite ends of said body, first sighting means carried on said first arm including a member having a sight opening therein, and second sighting means carried on said second arm



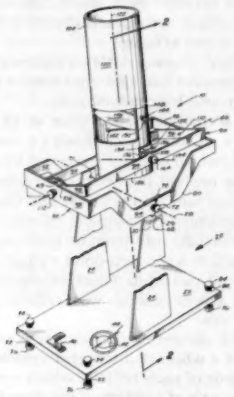
including a sighting pin, said member constituting a disc mounted on said first arm for rotation about an axis provided by said first arm.

4,159,576

RADIATION SHADOW INDICATOR

Richard A. Campbell, 1302 Toney Dr., Huntsville, Ala. 35802

Continuation of Ser. No. 778,311, Mar. 16, 1977, abandoned.
This application Oct. 31, 1978, Ser. No. 956,167
Int. Cl.[2] G01C *1/00*; **G02B** *21/24, 23/16*
U.S. Cl. 33—281 **7 Claims**



1. A portable instrument for establishing a period of time during which a terrestrial object adjacent a selected terrestrial location will occlude a celestial source of radiation comprising:

(a) a base positionable at said selected location;

(b) a first member selectively pivotal on the base about a latitude axis and having an azimuth axis perpendicular to the latitude axis;

(c) a second member selectively pivotal on the first member about the azimuth axis and having a declination axis perpendicular to and intersecting the azimuth axis;

(d) a sight tube selectively pivotal on the second member about the declination axis, the sight tube having an optic axis perpendicular to the declination axis and passing through a point at which the declination axis intersects the azimuth axis; and

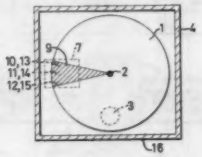
(e) means on the base for positioning the latitude axis such that the first member can be rotated on the base about the latitude axis to a selected position at which the azimuth axis is aligned with the terrestrial axis of rotation.

4,159,577

DEVICE FOR INDICATING A HORIZONTAL DIRECTION AND ONE OR MORE ANGLE SECTORS ABOUT SAID DIRECTION

Lars A. Bergkvist, Gottne, 890 42 Mellansel, Sweden

Filed Dec. 13, 1977, Ser. No. 860,046
Claims priority, application Sweden, Dec. 14, 1976, 7614074
Int. Cl.[2] G01C *9/06*
U.S. Cl. 33—366 **6 Claims**



1. A device for indicating both a horizontal direction and at least one angle sector about said direction, said device comprising a housing, a disc rotatably mounted with said housing surrounded by same and means on the disc offsetting the center of gravity of said disc relative to the axial center of rotation thereof, said disc including a substantially sector-shaped area having a light-transmissivity different from the remainder of said disc, reading means including plural light sources and light-sensitive elements arranged in source-receiver pairs with the disc passing between each source and respective receiver and said source-receiver pairs responsive to change in light-transmissivity for indicating the position of said disc relative to the orientation of said housing, said sector-shaped area being movable with the rotation of said disc between at least two conditions, the first of said conditions occurring where all the source-receiver pairs are covered by said sector-shaped area when the orientation of the housing indicates a first horizontal direction, the second of said conditions occurring when said housing is differently oriented whereby to rotate said disc angularly a given degree, said sector-shaped area of said disc being moved with said rotation uncovering at least one of said source-receiver pairs whereby to indicate an angle sector along said horizontal direction but within said area yet other than assumed at said first condition, said disc being capable of being rotated with change of orientation of said housing whereby to expose all of said source-receiver pairs when the degree of rotation is greater than said angle sector represented by said area.

4,159,578

DRYING OVEN

Ronald D. Walton, 5480 Dickens Dr., Baton Rouge, La. 70812

Filed Nov. 21, 1977, Ser. No. 853,579
Int. Cl.[2] F26B *11/02*
U.S. Cl. 34—344 **3 Claims**

1. An apparatus for drying material which apparatus comprises:

a. a drying chamber which includes,

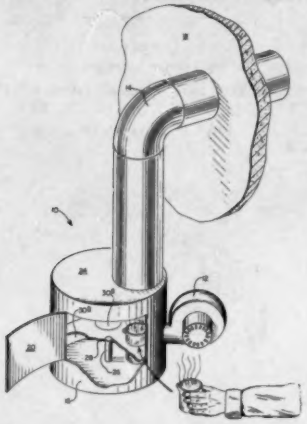
i. a circular planar top wall having an eccentric exhaust port,

ii. an annular sidewall downwardly depending from said top wall, said annular sidewall having an intake port radially located at a point beneath said exhaust port and said annular sidewall having an openable and closeable doorway for introducing said material to said drying chamber, and

iii. a circular, planar bottom wall closing off the bottom of said annular sidewall;

b. holding means enclosed within said drying chamber holding said material at a level adjacent said intake port;

c. a blower for heating and introducing dry gas to the interior of said drying chamber through said intake port; and



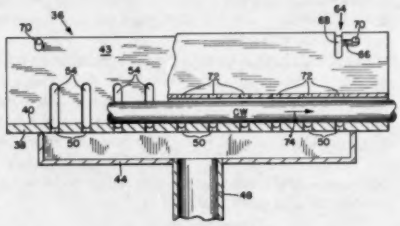
d. conduit means for routing exhaust gas from said drying chamber through said exhaust port to a disposal site.

4,159,579

STRAND DRYING APPARATUS

David C. Hoddinott, Preston, and Edwin L. Jette, Jr., Mystic, both of Conn., assignors to Crompton & Knowles Corporation, New York, N.Y.

Filed Apr. 11, 1978, Ser. No. 895,313
Int. Cl.² F26B *13/02*
U.S. Cl. 34—155 **8 Claims**



1. Apparatus for drying a wet continuous strand which is being advanced along its longitudinal axis comprising:

(a) an elongated trough member having a bottom and two surfaces extending upwardly from the base at an angle of less than 90° from the horizontal plane which passes through the base,

(b) a plenum chamber beneath the trough member,

(c) means for creating subatmospheric pressure in the plenum chamber, and

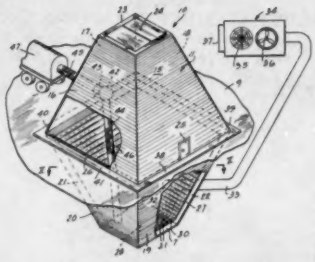
(d) a plurality of openings extending through the trough member substantially at the base and into the plenum chamber and at least one groove in at least one of said upwardly extending surfaces for each opening which extends beyond the point at which said surface is substantially tangent with a strand passing through said trough, whereby air is drawn about said wet strand and through said grooves and said openings into said plenum chamber to dry said strand.

4,159,580

GRAIN DRYING BIN

Richard Welch, Jr., 2016 W. Division, Grand Island, Nebr. 68801

Filed Nov. 25, 1977, Ser. No. 854,599
Int. Cl.² F26B *17/12*
U.S. Cl. 34—168 **5 Claims**



5. A grain drying bin for rapid drying of stored grains and having a simplified structural supporting system, comprising:

(a) an upper truncated pyramidal shaped housing section having at least three inwardly sloping planar side walls and a horizontal roof portion with a grain entry way;

(b) a lower inverted truncated pyramidal shaped housing section having the same number of planar inwardly sloping side walls as the upper housing section, ends of side walls of the bottom section joining directly to ends of side walls of the upper section, a lower horizontal floor portion also being provided;

(c) ventilation panels mounted in the lower housing section substantially parallel to and at a predetermined spacing from the side walls and floor portion; and

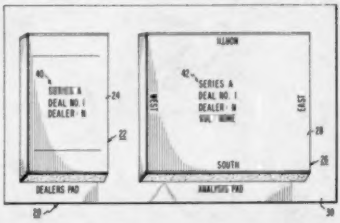
(d) a hot gas inlet aperture connected to the lower housing section to channel hot gas into spaces between the side walls and the ventilation panels.

4,159,581

DEVICE FOR INSTRUCTION IN THE GAME OF BRIDGE AND METHOD OF AND DEVICE FOR DEALING PREDETERMINED BRIDGE HANDS

Edward Lichtenberg, 615 Kings Hwy., Moorestown, N.J. 08057

Filed Aug. 22, 1977, Ser. No. 826,774
Int. Cl.² G09B *19/22*; A63F *1/00*
U.S. Cl. 35—8 B **9 Claims**



1. A device for use in the game of bridge comprising:

a plurality of first chart sheets each associated with a deal of bridge and supplying chart information for controlling the dealing of predetermined hands of cards to the four players of a bridge game without the players identifying the cards in the hands dealt to other players;

a plurality of second chart sheets individually associated with said first chart sheets, each for supplying the players with results of the deal corresponding to the associated first chart;

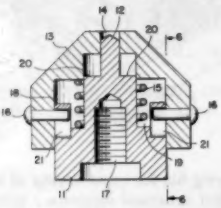
said first chart sheets including a first section for directing a cut of a pre-sorted deck of cards, a second section for directing the dealing of the cut deck into four identifiable hands of the deal, and a third section directing the distribution of the dealt hands to the four players in accordance with their positions around a bridge table.

4,159,582

GRIPPER ELEMENT FOR SPORTS SHOES

Eugene J. Ostrowski, 1088 Manor La., Bayshore, N.Y. 11706

Filed Jul. 10, 1978, Ser. No. 923,475
Int. Cl.[2] A43C *15/00*; A43B *5/00*
U.S. Cl. 36—67 D **9 Claims**



1. A non-slip gripper element for sports shoes, such as a shoe for use on artificial turf, comprising:

a. A base member adapted for securing to the outsole of a sports shoe, and having a spike projecting axially therefrom;

b. A cover, having an axial bore, slideably mounted on said spike;

c. Resilient means housed within the cover, for urging the cover away from the base member; and

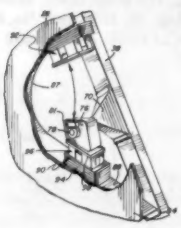
d. Means for limiting the axial movement of the cover.

4,159,583

ELEVATING SCRAPER UP-STOP MECHANISM

William J. Black, Wilmington; Warner G. Richardson, and Eugene M. Wilson, both of Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 18, 1977, Ser. No. 816,831
Int. Cl.[2] E02F *1/36*
U.S. Cl. 37—8 **3 Claims**



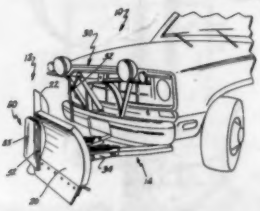
1. In a self-loading scraper having a bowl with a cutting blade at the forward end thereof, an elevator having a frame, a linkage assembly carried by said frame and being pivotally mounted about a fixed pivot on the inside of said bowl for positioning the lower portion of the elevator relative to said blade, said linkage assembly being such that the lower portion of the elevator will move upwardly and forwardly relative to said blade and the upper portion of the elevator will move upwardly and rearwardly relative to said bowl, laterally projecting stop means carried by an upper intermediate portion of the frame of said elevator, and vertically spaced apart, fixed stop means carried by said bowl, said laterally projecting stop means moving between said vertically spaced, fixed stop means for limiting upward and downward movement of said elevator relative to said bowl, said laterally projecting stop means is carried by a bracket on the frame of the elevator and comprises a block having planar contact faces for contacting a stop plate on each of said fixed stop means.

4,159,584

PUSH BUMPER

W. Wally Niemela, Box 165E, Chassell, Mich. 49916

Filed May 2, 1977, Ser. No. 793,085
Int. Cl.[2] E01H *5/04*
U.S. Cl. 37—44 **10 Claims**



1. A push bumper attachment to a conventional snow plow for use in pushing vehicles, said attachment comprising:

a support member attachable to the front of the snow plow and extending outwardly therefrom;

a rigid push plate; and

means for hingedly securing said push plate to said support member and for permitting said push plate to pivot about a generally vertical axis so as to pivot with and follow the vehicle being pushed, said means for hingedly securing said push plate to said support member including:

a first knuckle carried by said support member;

a second knuckle carried at the rear face of said push plate at the vertical centerline of said push plate;

a third knuckle carried at the rear face of said push plate in vertically spaced, coaxial alignment with said knuckles;

a manually removable hinge pin extending through said first, said second and said third knuckles;

a fourth knuckle secured to the rear face of said push plate in vertically spaced, coaxial alignment with said second and said third knuckles; and

a fifth knuckle carried by said support member in vertically spaced, coaxial alignment with said first knuckle, said hinge pin extending through said fourth and said fifth knuckles, said fourth knuckle being positioned below said fifth knuckle when said hinge pin extends therethrough, said support member dimensioned to position said hinge means outwardly and spaced from the snow plow to allow pivoting of said push plate.

4,159,585

ROTARY TRENCHER AND SHOE ASSEMBLY THEREFOR

Stanley L. Brown, Lenox, Iowa, assignor to Roscoe Brown Corporation, Lenox, Iowa

Division of Ser. No. 772,558, Feb. 28, 1977, Pat. No. 4,110,920. This application Jan. 16, 1978, Ser. No. 869,453
Int. Cl.[2] E02F *5/08*
U.S. Cl. 37—97 **4 Claims**

1. A trench excavating device comprising:

a support frame having forward and rearward ends;

a movable member having a continuous outer peripheral edge;

mounting means movably mounting said movable member to said frame for causing said outer peripheral edge to move in a continuous enclosed path;

power means for causing movement of said peripheral edge in said continuous path;

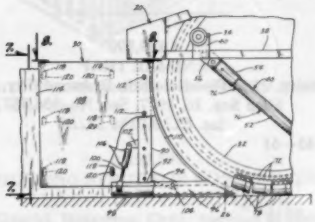
elevating means connected to said frame for causing raising

and lowering of said movable member with respect to the ground;

a plurality of excavating members connected around said peripheral edge of said movable member for engaging said ground to excavate a trench therein;

wheels rotatably supporting said frame for movement in a forward direction during excavation of said trench;

a shoe assembly mounted to said frame and positioned rearwardly of said movable member, said shoe assembly comprising a vertical shoe post rigidly connected to said support frame;



a pair of spaced apart shoe casing plates having forward ends fixed to said shoe post and having rearward ends trailing rearwardly therefrom in spaced relation;

said rearward ends of said shoe casing plates being sufficiently flexible to be laterally displaceable with respect to said forward ends when a curved trench is cut by said excavating members;

a plurality of cross members interconnecting said spaced apart casing plates rearwardly of said shoe post, each of said cross members being hingeably mounted at its opposite ends to said plates for hinged movement about a vertical axis.

4,159,586

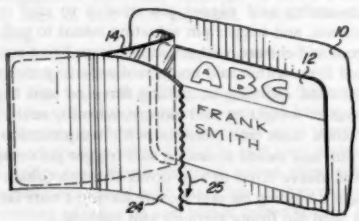
MULTILAYERED LABELING SYSTEM

Julian J. Blum, 7211 N. 3rd St., Phoenix, Ariz. 85020

Filed Sep. 15, 1977, Ser. No. 833,474

Int. Cl.[2] A44C *3/00*

U.S. Cl. 40—2 R **4 Claims**



1. A multilayered labeling system comprising:

(a) a label having an information surface and a back surface, said back surface having a pressure-sensitive adhesive thereon;

(b) a removable backing sheet releasably contacting the pressure-sensitive adhesive on the back surface of said label, said backing sheet extending beyond said label along one edge of said label;

(c) a transparent cover sheet having an inside and an outside surface, and having a pressure-sensitive adhesive on said inside surface facing the information surface of said label, said transparent cover sheet extending beyond said label with the pressure-sensitive adhesive on the inside surface thereof releasably contacting said removable backing sheet along said one edge of said label, said transparent cover sheet also contacting the information surface of said label along said one edge; and

(d) a removable separator sheet releasably contacting the pressure-sensitive adhesive on the inside surface of said transparent cover sheet.

4,159,587

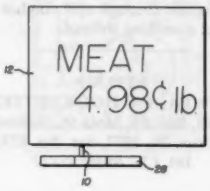
WEIGHTED PRICER

Robert J. Slavsky, Southfield, Mich., assignor to Shaw & Slavsky, Inc., Detroit, Mich.

Filed Jul. 11, 1977, Ser. No. 814,443

Int. Cl.[2] G09F *3/14*

U.S. Cl. 40—11 A **2 Claims**



1. A weighted pricer comprising a wire support; a price tag or similar article secured to an upper end of the wire support to be supported by it; and a weight secured to a lower end of the support for supporting the pricer and the article upon a food item whose price is to be displayed;

said support comprising a piece of wire whose upper end is curled and is bent roughly M-shaped in one plane to provide three locations for rivets to secure the support to the price tag occupying the same plane;

said wire also having its lower end bent transversely from the remainder of the support, so as to occupy a transverse plane, and having its lower end curled to provide a location for a rivet to secure the lower end to a sheet like weight;

said weight comprising a thin piece of heavy pliably lead-like material riveted to the lower end of the wire;

said weight being sufficiently pliable so as to be easily bent to conform to a contoured surface of the food item;

said weight being sufficiently heavy to maintain the pricer in a stable position on said food item; and

the lower end of said support, including said weight, are coated with a heavy, plastic, sanitary coating.

4,159,588

APPARATUS FOR SUPPORTING SPORTING GUNS DURING TESTING INTERVALS

Hans W. Pfeiffer, Am Eisenwerk, Plettenberg, Fed. Rep. of Germany

Filed Jul. 27, 1977, Ser. No. 819,616

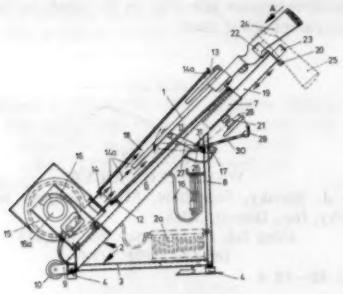
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637368

Int. Cl.[2] F41C *29/00*; A47F *7/00*

U.S. Cl. 42—90 **9 Claims**

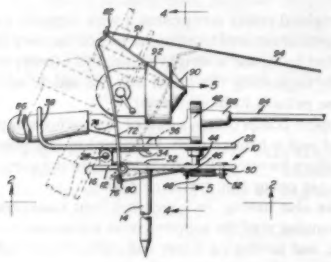
1. An apparatus for supporting sporting guns having a gun barrel following test-firing intervals to effect a cooling of said gun barrel, comprising a frame and support means for supporting said sporting gun, said frame including a conduit extending

in an inclined relationship to the ground for receiving at least said gun barrel and means for effecting a conducting of a



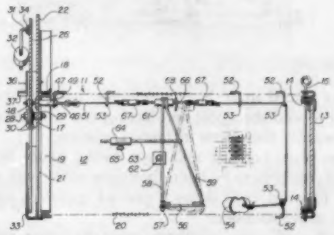
gaseous cooling medium through said conduit and around said gun barrel to effect a cooling thereof.

4,159,589
AUTOMATIC HOOK SETTER
Alfred E. Pendegraft, Box #1, Main St., Summerfield, Ill. 62289
Filed Nov. 29, 1977, Ser. No. 855,911
Int. Cl.[2] A01K *97/12*
U.S. Cl. 43—15 **2 Claims**



1. An automatic hook setter including an elongated horizontal base having first and second ends, an elongated horizontal mount having first and second ends, said mount being spaced above and overlying and extending along said base with the first end of said mount swingably supported from the first end of said base for angular displacement of said mount relative to said base about an axis extending transversely of said base and mount and between a first position with the second end of said mount spaced closely adjacent the second end of said base and a second position with said second end of said mount displaced away from the second end of said base, said second end of said base having an upstanding opening formed therethrough, said second end of said mount including a depending shank having a notch formed therein and projectable through said opening upon movement of said mount from said second position toward said first position, an elongated latch lever having first and second ends and underlying said base with said first end of said lever pivotally supported from said base for swinging about an upstanding axis between an inactive position with the second end of said lever spaced laterally to one side of said opening and an active position with the second end of said lever registered with said opening and engaged in the notch in said shank to prevent the latter from being withdrawn from said opening and swinging of said mount from said first position toward said second position, spring means connected between said lever and base yieldingly biasing said lever toward said active position, an elongated trigger arm having opposite ends, said trigger arm being pivotally supported from said base intermediate the opposite ends of said trigger arm for angular displacement of the latter about a transverse axis generally paralleling said axis extending transversely of said base, one end of said trigger arm being of a configuration adapted to be engaged by a fishing line supported from a fishing rod, an elongated connecting link extending and pivotally connected between the other end of said trigger arm and the other end of said latch lever, said one end of said trigger arm being adpated to have the fishing line engaged thereover in a manner such that tensioning of said line beyond a predetermined value will cause angular displacement of said trigger arm and thus angular displacement of said latch lever from said active position to said inactive position.

4,159,590
ANIMAL TRAP
Paul Palfalvy, 1105 Woodside Rd., Redwood City, Calif. 94061
Filed Sep. 26, 1977, Ser. No. 836,857
Int. Cl.[2] A01M *23/18*
U.S. Cl. 43—61 **6 Claims**

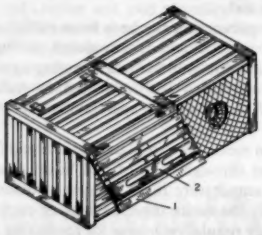


1. An animal trap comprising a body having an entrance end, a substantially planar cover for said entrance end formed with a first aperture for entrance of an animal into said body, a closure formed with a second aperture, means mounting said closure parallel to said cover for oscillation between a first position with said apertures aligned and a second position with said closure blocking said first aperture, said closure being weighted to fall from first to second positions, a trigger pin, said closure being formed with a third aperture in alignment with said pin when said closure is in first position and fitting through said closure to hold said closure in first position, means mounting said trigger pin relative to said cover for reciprocation, and trigger pin actuating means to pull said pin away from said closure, said actuating means being actuated by an animal from within said body, said actuating means before being actuated applying no pulling force on said trigger pin and a counter weight on said closure, whereby said closure in first position does not interfere with reciprocation of said trigger pin, said means mounting said trigger pin comprising a horizontal sleeve fixed to said cover through which said pin passes and a bushing on said closure having a bore larger than said pin, said pin fitting through said bushing.

4,159,591
PANELS FOR LOBSTER TRAPS
Emile A. P. Plante, 74 Badgers Island, Kittery, Me. 03904
Filed Oct. 3, 1977, Ser. No. 839,126
Int. Cl.[2] A01K *69/08*
U.S. Cl. 43—100 **2 Claims**

1. A substantially elongated rigid rectangular panel for lobster and crab traps, said panel constructed of water resistant plastic material such as polyethylene and having two spaced rectangular vents therethrough with rounded ends, said vents being of the order of one and three quarters inches (1¾") to one and seven eights inches (1⅞") by six inches (6") and having semi-circular ends, the outer longitudinal edges of the panels having two reinforcing ribs adjacent said edges and spaced

narrow slots extending through the ribs adjacent the said rectangular vents, said panels to be used to replace at least two of



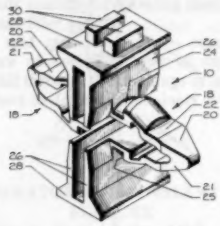
the lower laths of a conventional lobster trap or the lower side portion of a wire trap.

4,159,592

CLOSE COUPLING STRUT FOR CONSTRUCTION SET HAVING CLIP FASTENERS

Richard J. Gabriel, Beaverton, Oreg., assignor to Matrix Toys, Inc., Portland, Oreg.

Filed Jan. 10, 1978, Ser. No. 868,274
Int. Cl.[2] A63H *33/10*
U.S. Cl. 46—26 **6 Claims**



1. in a construction set having multi-faceted joint elements with a joint opening located in each facet, and elongate struts which have compressibly releasable clips at each end arranged to be engaged in said joint openings so as to interconnect adjacent ones of said joint elements, a close coupling strut comprising:

(a) paired clips, said clips facing in opposite directions generally along a common axis;

(b) said clips being elastically compressible for insertion into or removal from said joint openings, and having means for interlocking with said joint elements upon return to their released position when seated in said joint openings;

(c) a bridge interconnecting said paired clips, said bridge operably associated with said clips so that application of squeezing pressure on said bridge causes both of said clips associated therewith to be depressed.

4,159,593

GAME EMPLOYING MOVEMENT TO CONTROL THE OPERATION OF THE GAME

Anthony D. Miller, Redondo Beach, Calif., assignor to Tomy Corporation, Carson, Calif.

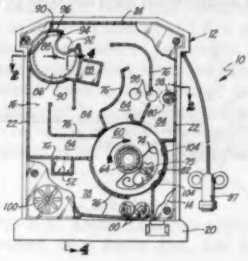
Filed Dec. 29, 1977, Ser. No. 865,498
Int. Cl.[2] A63F *7/02*
U.S. Cl. 46—42 **8 Claims**

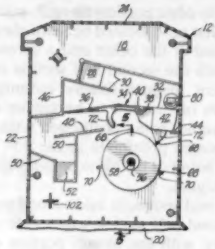
1. An apparatus in which objects are moved from an upper location to a lower location in which the improvement comprises:

an elongated lever adapted to receive downwardly passing objects from said upper location, said lever having a receiving end and a discharge end and being pivotally mounted intermediate said ends, said lever being weighted so that said receiving end will tend to move downwardly when there is no weight applied to said lever,

stop means for limiting the downward movement of said receiving end to a position in which said receiving end is located generally beneath said upper location and is positioned so as to receive at least one object passing downwardly from said supper location,

said lever being located with respect to said upper location so that after at least one object is delivered from said upper location and held on said receiving end an additional one of said objects passing from said upper location will engage said lever approximate the opposite side of





said pivot so as to rotate said discharge end downwardly to a position in which all of said objects on said lever move off of said lever,

a wheel rotatably mounted adjacent to said lever,

motion imparting means for rotating said wheel,

escapement teeth means mounted on said wheel equidistant from one another for positioning said wheel,

an escapement pawl located on said lever so as to interact with said teeth to permit limited rotation of said wheel each time said lever is rotated to said position in which said objects move off of said lever and means for permitting said objects to be moved from said lower location to said upper location.

4,159,594

DOLL AND SIMULATED FEEDING APPARATUS

Lawrence L. Reiner, 1 Hickory La., Woodbury, L.I., N.Y. 11797, and John O'Shaughnessy, Staten Island, N.Y., assignors to Lawrence L. Reiner, Woodbury, N.Y.

Filed Nov. 17, 1977, Ser. No. 852,191
Int. Cl.[2] A63H *33/26*
U.S. Cl. 46—239 **7 Claims**

1. Apparatus for simulating the feeding of food to a baby doll having a mouth portion, comprising

a toy spoon including a hollow bowl having an open-top front end portion and a rear end portion,

a handle projecting from the rear end portion of said bowl,

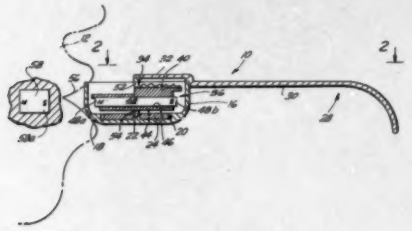
a cover member covering over the rear end portion of said bowl,

a circular disc rotatably mounted in said bowl portion and overlying the bottom wall thereof,

said circular disc having a first half-section having a flat upper surface serving as a false bottom of said bowl, and a second, opposite half-section decorated to simulate food,

said disc being turnable between a first operative position in which said first half section is in registry with and exposed at the front end portion of said bowl with said second half section in registry with the rear end portion of said bowl and concealed by said cover member, and a second operative position in which said second half section is in registry with and exposed at the front end portion of said bowl with said first half section in registry with the rear end portion of the bowl and concealed by said cover member,

a bar magnet mounted on the under surface of said disc and extending diametrically from one edge portion of said disc



to the opposite edge portion thereof, said magnet having at one end a first pole located beneath the first half section of said disc and at the other end a second opposite pole located beneath the second half section of said disc,

and a permanent magnet fixedly mounted adjacent the mouth portion of the doll to be fed by said spoon, said permanent magnet being positioned with one of its poles facing and located proximate to the doll mouth opening, said one pole being of the same polarity as the second pole of said bar magnet,

whereby when said spoon, in said second operative position with said second half section exposed to view, is brought into proximity with the mouth portion of said doll, the second pole of said bar magnet is repelled by said one pole of said permenent magnet to turn said disc to said first position in which its first half section is exposed to view.

4,159,595

INSTALLATION FOR CULTIVATING PLANTS

Jean L. Dalle, Manduel; Maurice Dumont, Grenoble; Andre Fourcy, Biviers; Aime Freychet, Grenoble, and Andre Gouzy, St. Nazaire-les-Eymes, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 539,106, Jan. 7, 1975, abandoned. This application Oct. 13, 1976, Ser. No. 732,090

Int. Cl.[2] A01G *13/00*

U.S. Cl. 47—2 **12 Claims**

1. An installation for regulating the temperature of soil for cultivating plants, comprising:

(a) a plurality of elongated hoses arranged in parallel and placed on the surface of the soil;

(b) each hose being formed of a non-self-supporting thin wall material defining an inner passage which can carry liquid therethrough so that when the hose is filled with liquid the hose will expand and lay flat with its width greater than its height and effectively regulate the temperature of the soil by transmitting the liquid temperature through the thin wall to the soil;

(c) means for preventing the hose from rolling and creating turbulence when liquid is circulated through the hose including said thin wall material forming upper and lower wall portions which are connected to each other at a plurality of places spaced apart along the length of said hose;

(d) circulation means for circulating said liquid from one end to the other through each of said hoses at a preselected regulated temperature in an amount sufficient to occupy substantially the entire inner passage of each hose; and

(e) temperature regulation means for regulating the temperature of said liquid.

4,159,596

MEANS AND A METHOD FOR THE SELF-POLLINATION OF CORN

Gilbert Downing, 2380 Harrison Rd., New Madison, Ohio 45346

Filed Feb. 3, 1978, Ser. No. 874,837

Int. Cl.[2] A01G *7/00*; **A01H** *1/02*

U.S. Cl. 47—58 **11 Claims**

1. A bag for use in the self-pollination of a corn plant having an ear shoot, a tassel and a tassel base portion, said bag comprising an elongated tubular member, said bag having a lower end portion configured to receive and surround the ear shoot of said corn plant, said bag having an upper end portion with means enabling said tassel base portion to extend from outside said upper end portion through and into said upper end portion and enabling said upper end portion to surround and enclose the tassel of said corn plant, the remainder of said bag being free of said corn plant and comprising a conduit connecting said upper portion enclosing said tassel and said lower portion surrounding said ear shoot whereby the pollen from said tassel is concentrated on the silk of said ear shoot to produce a well filled ear of excellent inbred purity and yield.

4,159,597

PLANTING SYSTEM INCLUDING ARTICLES OF MANUFACTURE

Robert C. Olsen, Streamwood, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 773,027, Feb. 28, 1977, abandoned. This application Jan. 16, 1978, Ser. No. 869,728

Int. Cl.[2] A01C *11/02*

U.S. Cl. 47—58 **6 Claims**

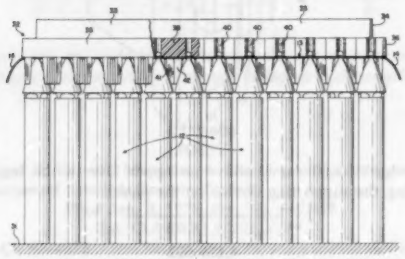
1. In a planting system including a carrier of a sheet of flexible elastic plastic material in which a plurality of containers for growing plants are held by the bottom ends thereof in said carrier in a pattern of a plurality of parallel rows and ranks transversely of said rows and in which the carrier is provided

with openings between said containers, the method of assembling and filling said containers for growing a plurality of plants in said containers as a unit comprising the steps of:

inverting said carrier and said plurality of containers on a substantially horizontal supporting surface,

providing and applying an inverted tray having a plurality of upstanding posts onto the bottom portions of said containers through said openings in said carrier,

inverting said plurality of containers and said tray to an upright position on said horizontal supporting surface,



providing and applying a filler plate having a plurality of holes therethrough arranged in the pattern of said containers in said carrier in said tray over the upper end of said containers,

depositing a bulk quantity of growing medium on the upper surface of said filler plate,

and brushing said growing medium repeatedly over the upper surface of said filler tray to cause the growing medium to fall through the openings in said filler tray into said containers to fill said containers with said growing medium.

4,159,598

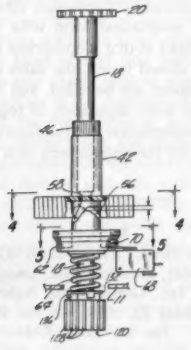
DOOR OPERATOR WITH INSTANT REVERSE FEATURE

Geoffrey H. Gatland, Walled Lake, Mich., and Kenneth L. Robitaille, Windsor, Canada, assignors to Vemco Products, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 584,620, Jun. 6, 1975, Pat. No. 4,055,023. This application Oct. 25, 1977, Ser. No. 845,289

Int. Cl.[2] E05F *15/10*

U.S. Cl. 49—28 **5 Claims**



1. In a door operator, a motor for moving the door between up and down limits; an operator body; an integral drive shaft supported by the body for rotation relative thereto and having opposite ends extending from said body; means on one end of the shaft and operated by said shaft for mechanical connection to the door to move the door as the shaft rotates; a first cam element disposed on the shaft and mechanically keyed thereto for rotation with the shaft and spaced from the operator body; a second cam element rotatably disposed on the shaft for at least limited rotation relative thereto between the first cam element and the operator body and bearing against the operator body; gear means connecting the motor directly to the second cam element independently of said shaft, said first and second cam elements being urged into complemental contact with one another to form a torque coupling between the motor and the shaft capable of transmitting torques to said shaft of less than a preset value and responsive to torques in excess of said value to cause said cam elements to slip relative to one another and to cause axial shift of the first cam element away from the second element and the body; adjustment means rotatably disposed on the other end of the shaft to manually selectively vary said preset value; and means carried by the body responsive to the axial shift of said first element to reverse the direction of operation of said motor, said cam elements each comprising alternating lobes and troughs in axially spatial complemental meshing engagement, said lobes and troughs being configured to permit relative slip between the elements at a lower torque level for rotation in one direction and a higher torque level for rotation in the other direction.

4,159,599

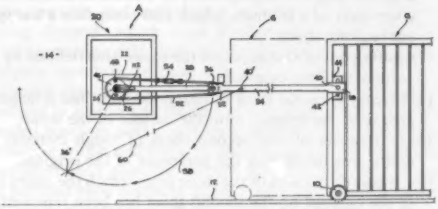
GATE-OPENING AND CLOSING ASSEMBLY

Moscow K. Richmond, 2819 Butler Ave., Los Angeles, Calif. 90066

Filed May 2, 1977, Ser. No. 792,506

Int. Cl.[2] E05F *11/12, 15/00*

U.S. Cl. 49—363 **43 Claims**



1. An assembly for shifting a gate from a closed position across an access opening to an opened position and from the opened position to the closed position, said assembly comprising

(a) a drive motor,

(b) a first lever arm operatively coupled to said drive motor, and capable of being driven through an arcuate path upon energization of said motor,

(c) a second lever arm pivotally coupled to said first lever arm by a pivotal connection, said second lever arm also moving through a somewhat arcuate path upon movement of said first lever arm, said first and second lever arms each being substantially smaller in length than the length of movement of said gate across said access opening and said first lever arm having its longitudinal axis generally parallel in space to the longitudinal axis of said second lever arm and when the gate is in the closed position, said lever arms being aligned with one another when said gate has moved over a portion of the access opening between the closed and opened positions, said lever arms crossing over one another when said gate has moved over a further portion of the access opening in the direction of travel and said lever arms separating away from the aligned position after crossing over one another in the same direction of travel so that said gate further moves across said access opening in the same direction of travel,

(d) and means pivotally coupling said second lever arm to said gate.

4,159,600

METHOD FOR REPRODUCING PHOTOGRAPHS, DRAWINGS, OR THE LIKE, ON MARBLE OR GRANITE

Gerald P. Kaminski, 7395 Middlebury, Lambertville, Mich. 48144

Filed Apr. 20, 1978, Ser. No. 898,302
Int. Cl.[2] B24C *1/04*
U.S. Cl. 51—312 4 Claims

1. A method for reproducing an original representation, such as a photograph, a drawing or the like, on stone such as granite, marble or the like, said method comprising the steps of:

(1) cutting areas corresponding to shaded areas of the original out of a first sheet of tough material that is capable of withstanding the impingement of blasted sand and that is a top layer of a laminate which also comprises a transparent backing sheet;

(2) cutting out of said laminate the entire area defined by the perimeter of the original;

(3) placing a second sheet of tough material that is larger in area than the original onto the surface of the stone;

(4) cutting out of said second sheet of tough material the entire area defined by the perimeter of the original;

(5) "dusting" the area of the stone from which the entire area of the original on the second sheet has been removed;

(6) placing the cutout laminate in the open area of said second sheet and adhering the laminate to the stone;

(7) sand blasting through all of the cutout areas of said sheets of tough material and

(8) removing said sheets and said laminate from the stone.

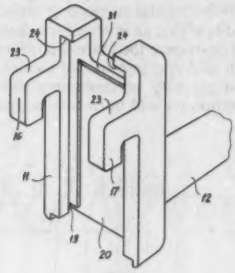
4,159,601

BEARER PANEL WITH MOVABLE SUPPORTING DEVICES

Claus Ebert, Kronberg, and Wolfgang Fabian, Mannheim, both of Fed. Rep. of Germany, assignors to Isopol A.G., Switzerland

Filed Apr. 25, 1977, Ser. No. 790,670
Claims priority, application Switzerland, Apr. 23, 1976, 5123/76; Feb. 10, 1977, 1595/77
Int. Cl.[2] E04D *13/00*
U.S. Cl. 52—36 12 Claims

1. A bearer panel comprising; a panel body; and devices for supporting tools and the like, the devices being supportable by the body, which for this purpose has horizontal transverse grooves inwardly expanding in a sectional profile thereof, and each supporting device having a down-turned hook-shaped lug, disposed in an upper region thereof and insertable in one of the grooves, and having a slide-piece having an ear insertable in said groove, said slide-piece being movable vertically along a grooved portion of the supporting device upwards until the



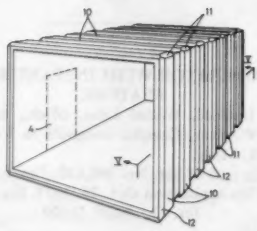
top edge of said ear is above an upper face of the lug, for locking the supporting device on the panel.

4,159,602

THREE-DIMENSIONAL CONSTRUCTION ELEMENT COMPRISING A BODY OF GENERALLY POLYHEDRAL FORM

Andre M. Polack, Brussels, Belgium, assignor to Matrapa S.A., Geneva, Switzerland

Filed Apr. 7, 1977, Ser. No. 785,571
Claims priority, application Switzerland, Apr. 9, 1976, 04577/76
Int. Cl.[2] E04B *1/348*
U.S. Cl. 52—79.9 27 Claims



1. A three-dimensional construction element comprising a body of generally polyhedral form with an aperture therethrough, characterized in that it comprises at least one peripheral rib forming a closed frame, the sides of said rib and the corners of said element are bevelled, and in that grooves located beside the rib form, separately or together, a geometric figure which is complementary to the figure formed by the rib thereby providing for the engagement of another complementary rib therein.

4,159,603

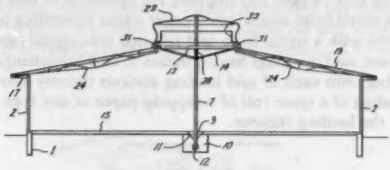
CIRCULAR BUILDING

Leonard F. Schroeder, Houston, Tex., assignor to Concept Fiberglass Homes, Inc., Grand Island, Nebr.

Filed May 22, 1978, Ser. No. 907,980
Int. Cl.[2] E04B *7/00*
U.S. Cl. 52—82 1 Claim

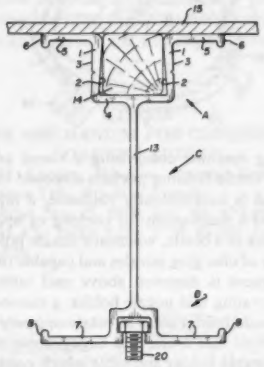
1. In a building, a circular foundation, a center column mounted in said foundation, vertically extended wall panels anchored in said foundation, roof sections mounted on said vertical panels at one end and secured to said center column at the other end, each roof panel being provided with longitudinal reinforcing bars, said reinforcing bars having one end protruding past the inner end of said roof panel, stirrups on said

center ring adapted to receive said protruding end of said reinforcing bar and each roof panel being upwardly turned at



its inner end, and overturned at its inwardly extending terminal forming a hook extending over and resting on said center ring.

4,159,604
JOIST
Michael P. Burrell, Mississauga, Canada, assignor to Anthes Equipment Limited, Ontario, Canada
Filed Jan. 5, 1978, Ser. No. 867,458
Int. Cl.[2] E04C *3/292, 3/04*
U.S. Cl. 52—376 **6 Claims**



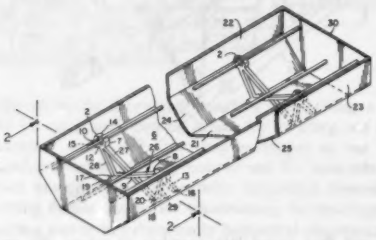
1. A joist for shoring concrete slabs, said joist consisting of an extruded, elongated channel member presenting an upper chord, a lower chord, and chord connecting means intermediate said chords;

said upper chord defining a channel, substantially U-shaped in cross-section, having side walls with inner and outer faces, and a bottom wall with a flat inner face and an outer face, the inner faces of said side walls being angulated with respect to said planar bottom wall, and converging towards one another in the direction of the upper portion of the channel, the outer faces of said side walls being parallel to one another such that each of said side walls increases in transverse cross-section from the bottom wall to the free end thereof, said side walls being elastically deformable so that they can be sprung outwardly to permit the introduction of a removable insert into said channel, the transverse dimension of the inner face of the bottom wall being greater than the transverse dimension of the removable insert; each of said side walls terminating, at its upper free end in an upper outwardly extending horizontal flange which, in itself, terminates, in a downwardly extending stub-flange parallel with and spaced from its associated said side wall;

said lower chord being defined by a pair of lower horizontal flanges each parallel with and spaced from said upper flanges and terminating in an upwardly extending stub-flange;

said chord connecting means comprising a central web extending between said upper and lower chords, the stub-flanges on said lower chord being substantially parallel with said web member.

4,159,605
PARKING CURB REINFORCING BAR SUPPORT
Robert J. Ilukowicz, Coram, N.Y., assignor to Preco Industries Ltd., Plainview, N.Y.
Filed Mar. 28, 1977, Ser. No. 781,783
Int. Cl.[2] E04C *5/20*
U.S. Cl. 52—687 **3 Claims**



1. A plurality of parallel reinforcing rods and at least one monolithic parking curb reinforcing rod support; said support including a frame having first and second support portions and a third optional support portion receiving and retaining said reinforcing rods, the first and second support portions being located at a higher level than the optional third of the support portions; said first and second support portions opening directly upwards and including a surrounding wall with an opening through which a reinforcing rod can be inserted, means connecting said first and second support portions and projecting members defining a plurality of support points by which said parking curb reinforcing rod support can be stably supported in a form and the reinforcing rods placed at predetermined positions within said form whereby upon the casting of concrete within said form the reinforcing rods will be placed at predetermined positions therein; said first and second support portions each mutually aligned with two parallel projections and said connecting means comprising diagonal connection pieces joining said projections to the bases of the first and second support portions, the juncture of the intersection of said connection pieces defining the third optional support portion for receiving a reinforcing rod, said projecting members including one pair of arms extending diagonally from the bases of the first and second support portions respectively.

4,159,606
BEAM AND METHOD OF MAKING IT
Bengt Å. Kindberg, Kadettvagen 29, 230 50 Bjärred, Sweden
Filed Sep. 19, 1977, Ser. No. 834,594
Claims priority, application Sweden, Sep. 24, 1976, 7610600
Int. Cl.[2] E04C *3/02*
U.S. Cl. 52—692 **10 Claims**

1. An elongated beam comprising

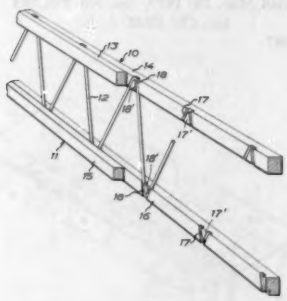
a metal wire web member bent alternately back and forth to lie in a plane with a plurality of bent portions defining a pair of lines;

a first wood lath member having in a first surface thereof a first plurality of recesses shaped substantially to conform to the bent portions of one of said pair of lines of said wire web member while leaving within said first plurality of recesses the wood conforming to the open centers of said bent portions of said one of said pair of lines, the bent portions of said one of said pair of lines being positioned in said first plurality of recesses;

a second wood lath member having in a first surface thereof a second plurality of recesses shaped substantially to conform to the bent portions of the other of said pair of lines

of said wire web member while leaving within said second plurality of recesses the wood conforming to the open centers of said bent portions of said other of said pair of lines, the bent portions of said other of said pair of lines being positioned in said second plurality of recesses;

a third wood lath member substantially coextensive with said first wood lath member and glued to said first surface



of said first wood lath member to cover the recesses thereof and to retain therein said bent portions of said one of said pair of lines; and

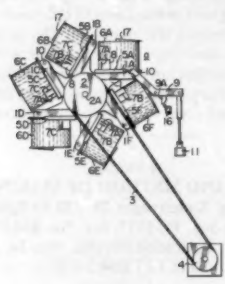
a fourth wood lath member substantially coextensive with said second wood lath member and glued to said first surface of said second wood lath member to cover the recesses thereof and to retain therein said bent portions of said other of said pair of lines.

4,159,607

WRAPPING PAPER SELECTING SYSTEM FOR USE IN COIN PACKAGING MACHINE

Isamu Uchida; Kenkichi Watanabe, and Katusuke Furuya, all of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Japan

Filed Feb. 3, 1978, Ser. No. 874,751
Int. Cl.[2] B65B *57/08*
U.S. Cl. 53—64 **3 Claims**



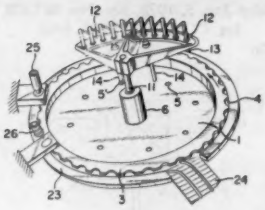
1. A wrapping paper selecting system for use in a coin packaging machine including a coin selecting dial for selecting a desired type of coin, a wrapping paper supporting table having a plurality of loading stations each for wrapping paper for a different type of coin, a wrapping paper feeding station and a drive for driving the supporting table so as to bring a desired one of the loading stations into the feeding station, said wrapping paper selecting system comprising a selected coin signal generating means associated with said coin selecting dial for producing a signal indicative of the type of coin which has been selected to be wrapped, a plurality of markings each provided in a corresponding one of said loading stations to identify the corresponding loading station, a selected paper signal generating means provided in said feeding station for detecting said markings and producing a signal indicative of which loading station has been brought into said feeding station, and a controlling means for initiating operation of said drive when said coin selecting dial is set in a position to select a desired type of coin and stopping the operation of said drive when a signal from said selected paper signal generating means coincides with a signal from said selected coin signal generating means, said markings having means to enable exchangeable mounting onto each of said loading stations thereby allowing the loading of a spare roll of wrapping paper of any type onto any of the loading stations.

4,159,608

BOTTLING MACHINE

Sinzo Masuda, Shimizu, and Tsuneyuki Okochi, Shizuoka, both of Japan, assignors to Package Engineering Corporation, Shizuoka, Japan

Filed Apr. 28, 1978, Ser. No. 901,172
Int. Cl.[2] B65B *3/04, 7/28;* B67B *1/04, 5/06*
U.S. Cl. 53—282 **4 Claims**



1. A bottling machine comprising a round table which is equipped with bottle-holding pockets disposed on the periphery thereof and is intermittently rotatable, a liquid charging mechanism, and a mechanism for corking or applying a capbond on the neck of a bottle, wherein a nozzle holder equipped with a plurality of charging nozzles and capable of rotation and vertical movement is disposed above said table, a working member for elevating said nozzle holder, a member for always biasing said nozzle holder so as to rotate opposite to the direction of rotation of said table, and engagement members provided on said nozzle holder and table which engage with each other when the nozzle holder descends and disengages from each other when the holder ascends, whereby at the time when the nozzle holder descends and rotates together with the table, the charging in the bottles is performed by the nozzles, and after completion of the charging, the foregoing working member elevates the nozzle holder to allow it to return to its original position.

4,159,609

PROCESS AND DEVICE FOR INSERTION OF TWO ROWS OF OBJECTS INTO A PACKAGE

Heinz Focke, Moorestrasse, 309 Verden, Fed. Rep. of Germany

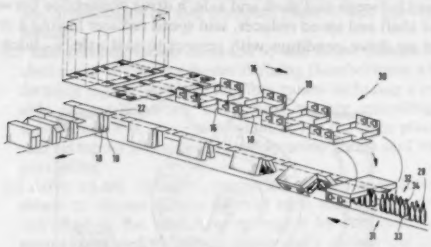
Continuation-in-part of Ser. No. 633,136, Nov. 18, 1975, Pat. No. 4,057,950, which is a division of Ser. No. 390,263, Aug. 21, 1973, Pat. No. 3,937,391, which is a continuation-in-part of Ser. No. 83,581, Oct. 23, 1970, abandoned. This application Sep. 14, 1977, Ser. No. 833,209

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1969, 1953350

Int. Cl.[2] B65B *11/10*
U.S. Cl. 53—452 **6 Claims**

1. A process for inserting two rows of articles such as bottles, cans or the like into a container which is formed from a one-piece planar blank of foldable material having a one-piece undivided rectilinear top wall, side walls integral with said top wall on both sides thereof, bottom walls integral with the side walls and edge flaps integral with the bottom walls comprising folding the bottom walls and edge flaps simultaneously relative to said top wall and side walls so as to dispose said bottom

walls and edge flaps at right angles to said top wall and side walls, initially spreading the two rows of articles relative to each other, placing the folded blank on the two rows of articles with the top wall of the blank in engagement with the tops of the articles, simultaneously further spreading the bottoms of the two rows of articles apart and folding the side walls of the container relative to the top wall of the container until said side



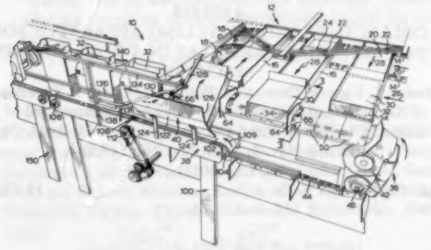
walls contact the sides of the articles and the previously folded bottom walls of the container contact the bottoms of the articles, bending the edge flaps upwardly between the two rows into engagement with the opposed sides of the two rows of articles, pressing the edge flaps together by bringing the two rows of articles together and adhesively securing the flaps together.

4,159,610

CLOSURE MECHANISM FOR CLOSING END OF LOADED CARTONS

Marinus J. M. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Ltd., Rexdale, Canada

Filed Jan. 27, 1978, Ser. No. 872,999
Int. Cl.[2] B65B *5/04, 7/20, 63/00, 1/22*
U.S. Cl. 53—525 **12 Claims**



1. In a packaging machine having a first conveyor for supporting and transporting a plurality of loaded cartons to an end closure station, the cartons being supported by the first conveyor in a configuration in which each carton has an open end and a closed end disposed opposite one another and oriented in substantially vertical planes and means for laterally discharging said cartons from said first conveyor, the improvement of;

(a) a transfer mechanism including transfer conveyor means having a forward run, means mounting at least a portion of said forward run in a side-by-side relationship in substantially the same plane with at least a portion of said first conveyor for receiving cartons which are laterally displaced from said first conveyor, said transfer mechanism including means to reorient said cartons to a second position in which the open ends thereof open upwardly,

(b) closure means for closing the open ends of said cartons after the cartons are located in said second position, and

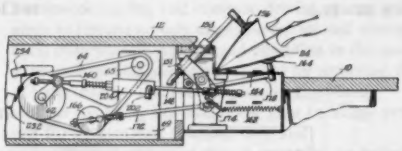
(c) drive means for driving said transfer conveyor at a speed synchronized with the speed of said first conveyor.

4,159,611

ENVELOPE PROCESSING MACHINE AND METHOD

Robert J. Russell, Camden, N.J., assignor to Mail-Ex Corporation, Skokie, Ill.

Continuation-in-part of Ser. No. 707,723, Jul. 22, 1976, abandoned. This application May 31, 1977, Ser. No. 801,454
Int. Cl.[2] B65B *43/30*
U.S. Cl. 53—569 **21 Claims**



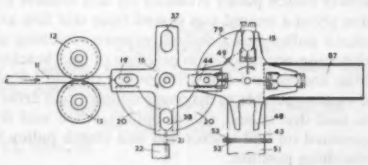
1. An envelope processing machine comprising a supply hopper for envelopes, cutting means for severing one edge of an envelope, means for removing envelopes in one by one relationship from the supply hopper and for transmitting the removed envelopes in substantially horizontal disposition to the cutting means, means for transmitting the envelopes from the cutting means in substantially horizontal disposition to an envelope processing station, and envelope opening means comprising a pair of suction cups operable upon opposing faces of the envelope at said envelope processing station for opening an envelope by moving each side thereof upwardly from horizontal position and holding it open for manual removal of envelope contents.

4,159,612

PRODUCTION OF LOLLIPOPS OR LIKE SWEETS

Reginald F. Johnson, and Leonard Sutton, both of Gainsborough, England, assignors to Baker Perkins Holdings Limited, Peterborough, England

Filed Oct. 26, 1977, Ser. No. 845,633
Int. Cl.[2] B29C *3/02;* **B29D** *3/00;* **A23G** *3/12*
U.S. Cl. 53—594 **6 Claims**

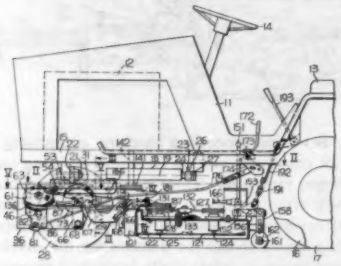


1. Apparatus for producing sweets, said apparatus comprising an intermittently movable pocketed forming conveyor, means for feeding a toffee rope in timed relationship with said conveyor for its leading portion to be presented in register with successive pockets of said conveyor, means for severing such leading portion and compressing it into the pocket of the conveyor for the time being at rest at a first forming station roughly to form an individual sweet, means for indexing said conveyor to carry the sweet to a stick-inserting station, means for feeding a stick into and through stick-guiding means on said conveyor, and means for pressing said stick into said sweet, and means, operating substantially simultaneously with the stick-feeding means, for compressing the sweet in the pocket finally to form it, the conveyor indexing means then again operable to carry the pocket to a delivery station, said apparatus being characterised by the provision of means for resiliently nipping the stick against a surface of said stick-guiding means during the stick-inserting operation and for maintaining the nipping pressure during movement of the sweet in said pocket to the delivery station.

4,159,613
MOWER ATTACHMENT WITH DRIVE SUBASSEMBLY ADAPTED FOR DETACHABLE CONNECTION TO A TRACTOR

Henry T. Knudson, Grafton, and Kenneth H. Klas, Port Washington, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 18, 1977, Ser. No. 825,532
Int. Cl.[2] A01D *35/26*
U.S. Cl. 56—11.3 **16 Claims**



1. A mower attachment for a riding tractor having a power unit, a power take-off shaft with a drive pulley and a mower clutch operating lever shiftable between clutching and declutching positions, said attachment comprising:

a mower subassembly including

a rotating cutting blade,

drive means for said blade including a driven pulley, and

a brake mechanism for stopping said blade,

a drive subassembly including

a frame adapted for releasable mounting on said tractor and pivotally connected in draft relation to said mower subassembly permitting the latter to be lowered and raised relative to said drive subassembly between mowing and transport positions,

a mower clutch pulley support bracket mounted on said frame for swinging about a first axis, and

a mower clutch pulley mounted on said bracket for rotation about a second axis spaced from said first axis, said clutch pulley being shifted between clutching and declutching positions upon pivoting of said bracket away from and toward said drive pulley on said tractor,

belt means operable to drivingly connect said drive pulley to said driven and clutch pulleys when said frame is mounted on said tractor and said clutch pulley is in its clutching position,

an operating linkage connected at one end to said clutch pulley support bracket and adapted at its other end for connection to said clutch operating lever, whereby movement of the latter between its clutching and declutching positions causes the clutch pulley to move between its clutching and declutching positions thereby connecting said blade to and disconnecting said blade from said power unit, and

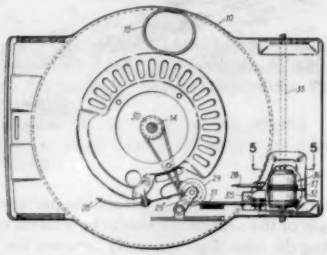
motion transmitting means operatively connecting said operating linkage to said brake mechanism whereby the latter is actuated to stop rotation of said blade when said clutch pulley is moved to its declutching position.

4,159,614
LAWN MOWER CONTROLS

George A. Thomas, Des Moines, and C. Dean Peterson, Ankeny, both of Iowa, assignors to AMF Incorporated, White Plains, N.Y.

Filed Oct. 27, 1977, Ser. No. 846,233
Int. Cl.[2] A01D *35/26*
U.S. Cl. 56—11.6 **3 Claims**

1. In a rotary type lawn mower comprising a mower deck, front and rear pairs of wheels for said deck, a grass cutting blade below said deck, power means on said deck including a shaft extending through said deck from said power means to said blade, and a handle for the guiding said mower along the ground, said handle extending to the rear of said mower; improved means for driving one pair of said wheels and controlling said mower, comprising a drive axle for said one pair of wheels and a speed reducer on said drive axle for reducing the speed between said shaft and axle, a drive connection between said shaft and speed reducer, said speed reducer having a drive and no drive condition with respect to said axle, a clutch on

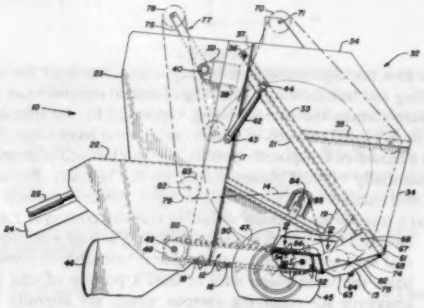


said speed reducer for controlling said condition, and a manual control on said handle for controlling said clutch; said drive connection between said shaft and speed reducer comprising a variable one to provide different speeds to said axle for varying the speed of said mower along the ground, and another manual control on said handle for controlling said variable drive connection; said clutch comprising a wrap around spring on said speed reducer, and said variable drive connection comprising a split V pulley on said shaft, another V pulley on said speed reducer, a V drive belt interconnecting the two pulleys, and means controlled by said another manual control for controlling the tension of said belt on said pulleys.

4,159,615
COLLECTION AND RECYCLING APPARATUS FOR CROP MATERIAL PARTICLES IN A ROLL FORMING MACHINE

Edward T. Eggers; Thomas W. Waldrop; Donald L. Sheesley, all of New Holland, and Willis R. Campbell, Ephrata, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Nov. 2, 1977, Ser. No. 847,994
Int. Cl.[2] A01D *39/00*
U.S. Cl. 56—341 **11 Claims**



1. A roll forming machine for crop material comprising:

(a) a mobile frame adapted to move across an open field, said frame having a front end, two opposing sides, and a rear end;

(b) conveying means fixed to said frame, said conveying means having a front end, two opposing sides and a rear

end thereby defining a transport plane along which crop material is moved from said front end towards said rear end, said front end, opposing sides and rear end of said conveying means further being in substantially the same orientation as said front end, opposing sides and rear end of said frame;

(c) pickup means mounted to said frame adjacent said front end of said conveying means for engaging crop material and depositing it on said transport plane of said conveying means;

(d) bale forming means mounted to said frame substantially above said conveying means defining therebetween a bale forming region, said bale forming means including a movable motion-imparting curvilinear surface extending at least from a first location substantially in the same plane as said transport plane to a second location above said transport plane;

(e) drive means operably connected to said bale forming means to impart motion thereto such that crop material delivered to the bale forming region by said conveying means is rotated to form a substantially cylindrical bale;

(f) collection means supported on said frame adjacent said conveying means' rear end, said collection means positioned below said transport plane and at least partially below said first location of said bale forming means; and

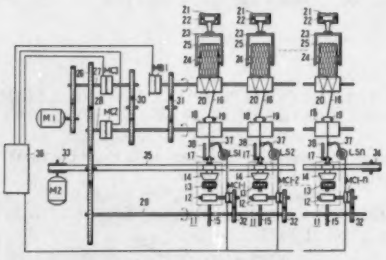
(g) stripping means operably associated with said conveying means at the rear end of said transport plane to strip off and elevate the crop material from said conveying means and direct said crop material into contact with said bale forming means so as to initiate rotation of said crop material for inclusion in the crop, said stripping means further including at least a pair of transversely adjustable stripping elements positioned along said transport plane adjacent said rear end of said conveying means and extending forwardly therefrom a predetermined distance, each stripping element includng a tapered stripping surface extending inwardly and upwardly from said transport plane to a first predetermined height such that at least a portion of said conveying means travels beneath and between said stripping surfaces thereby reducing the amount of crop material that is directed into said collection means for ultimate recycling to said bale forming region for inclusion in the crop roll.

4,159,616

METHOD FOR CONTROLLING AN OPEN-END SPINNING FRAME AND AN APPARATUS THEREFOR

Tatsuo Takeuchi, Chita; Kazuyoshi Ono, Chiryu; Naotake Furukawa, Chita; Katsuaki Sugiura, Okazaki; Osamu Suzuki, Obu, and Takeshi Shimizu, Kariya, all of Japan, assignors to Kabushiki Kaisha, Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Jan. 19, 1978, Ser. No. 870,687
Int. Cl.² D01H *13/18, 1/12*
U.S. Cl. 57—83 **3 Claims**



3. In an apparatus for controlling an open-end spinning frame which includes a plurality of spinning units and wherein discrete fibers are supplied by fiber feed means into rotary spinning chambers to form yarns which are drawn out of said spinning chambers to form yarn packages due to the rotation of take-up rollers; the improvements comprising:

electromagnetic clutches provided one for each spinning unit between fiber feed means of respective spinning units and a common driving source for driving said fiber feed means;

a fiber feed control circuit operative to hold all said electromagnetic clutches in a released or disengaged condition at the time of starting said common driving source and operative to simultaneously change-over all said electromagnetic clutches into an engaged condition in the course of yarn ending which is being effected by returning the end of yarn back to said rotary spinning chambers;

means for detecting occurrence of yarn breakage provided one for each of said spinning unit; and

a yarn breakage detecting circuit operative to individually disengage any one of said electromagnetic clutches in said spinning units in response to a detecting signal from said detecting means, said yarn breakage detecting circuit being adapted to be change-over into an operative condition by said fiber feed control circuit after said electromagnetic clutches have been changed-over into an engaged condition.

4,159,617

RESILIENT POLYESTER FIBERS

John T. Allan, Charlotte, N.C., assignor to Fiber Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 877,470, Nov. 17, 1969, abandoned, which is a continuation-in-part of Ser. No. 806,721, Mar. 12, 1969, abandoned. This application May 27, 1971, Ser. No. 147,688
Int. Cl.² D02G *3/04, 1/00, 3/02*
U.S. Cl. 57—247 **28 Claims**

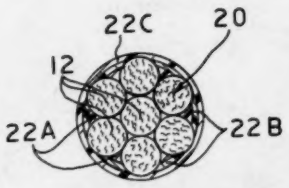
1. A resilient drawn polyester textile fiber comprising at least 50 mol percent of poly(tetramethylene terephthalate), said fiber having a toughness (tenacity × elongation ÷ 200) of at least 0.75 grams/denier and a bending recovery at 20 percent surface strain of at least 55%.

4,159,618

COMPOSITE YARN

Jerry G. Sokaris, Troy, N.Y., assignor to Albany International Corp., Albany, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,756
Int. Cl.² D02G *3/18, 3/36*
U.S. Cl. 57—251 **10 Claims**



1. A high temperature resistant, composite yarn having the appearance and physical characteristics of a monofilament yarn, which comprises;

a core of a twisted, multi or spun filament yarn, said filament being of a high temperature resistant, synthetic material; and

an outer coating of a high temperature resistant, synthetic, polymeric resin, said coating comprising a plurality of coating layers, including a plurality of inner layers intimately bonded to the core and filling the helix of the twist in the core yarn only and outer layers being bonded to the inner layers and encapsulating the inner layers and the

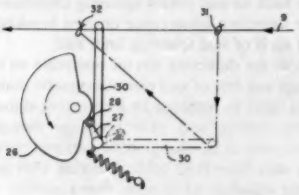
core so as to give the composite yarn the appearance and characteristics of a mono-filament.

4,159,619

METHOD FOR PRODUCING NOVELTY YARNS

Ernest J. Griset, Jr., Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 722,881, Sep. 13, 1976, Pat. No. 4,080,777.
This application Oct. 25, 1977, Ser. No. 845,043
Int. Cl.[2] D02G *3/34, 3/36, 3/44*
U.S. Cl. 57—295 **8 Claims**



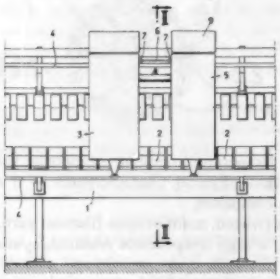
1. A method of making a novelty yarn comprising a core strand and an effect strand comprising the steps of feeding the core strand at a first predetermined rate into a tangling zone and withdrawing the core strand from the tangling zone at a second predetermined rate that is less than the first predetermined rate; simultaneously feeding an effect strand at a third predetermined rate to the tangling zone and alternately positively and abruptly tensioning and relaxing the effect strand at the tangling zone and withdrawing the effect strand with the core strand at the second predetermined rate to form a composite yarn wherein the effect yarn is alternately compacted and fluffed relative to the core yarn; said third predetermined rate being higher than the second predetermined rate and at least equal to the first predetermined rate, said abrupt tensioning and relaxing of the yarn being effected by intermittently and abruptly changing the path of the yarn, said yarn being stretched during the tensioning step and abruptely made slack during the relaxing step.

4,159,620

YARN-PIECING AND CLEANING SYSTEM FOR A SPINNING MACHINE

Régis LaFlaquiere, and Radé Janousek, both of Mulhouse, France, assignors to Societe Alsacienne de Constructions Mecaniques de Mulhouse, France

Filed Jan. 31, 1978, Ser. No. 873,944
Claims priority, application France, Feb. 2, 1977, 77 02838
Int. Cl.[2] D01H *11/00, 15/00*
U.S. Cl. 57—301 **6 Claims**



1. A yarn-piecing and cleaning system for an open-ended spinning machine, comprising:

a first carriage means travelling on a track along the machine, for carrying out piecing operations;

second carriage means, distinct from said first carriage means, for carrying out cleaning operations, said second carriage means including means mechanically coupling both of said carriage means to each other;

an air generator means for at least blowing air into said machine, said air generator means being mounted upon said second carriage;

first flexible duct means, connected to said air generator and connecting an interior of said first carriage means to an interior of said second carriage means, said second carriage means including a reservoir to collect dirt and yarn waste from said machine;

a second duct means with at least one nozzle connected to said air generator for directing said blowing air into said machine; and

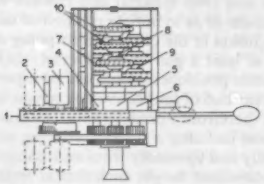
filter means for retaining waste in said second carriage.

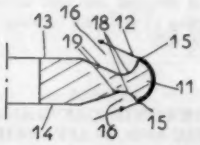
4,159,621

FRICTION DISC FOR FALSE TWISTING

Christian Bru, Renaison, France, assignor to ASA S.A., Roanne, France

Filed May 23, 1978, Ser. No. 908,674
Claims priority, application France, May 25, 1977, 77 16634
Int. Cl.[2] D02G *1/04*
U.S. Cl. 57—338 **12 Claims**





10. A false twisting spindle having at least two axles, there being, on each axle, at least one friction disc, the friction discs overlapping and at least some of the discs comprising a convex peripheral surface to be contacted by a yarn and upper and lower faces, a recess having a cylindrical outer side wall provided in at least one of said faces, and a sharp edge defined at a position between said recess and said convex peripheral surface.

4,159,622

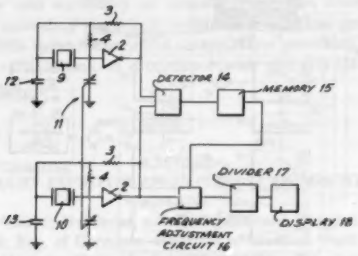
ELECTRONIC TIMEPIECE HAVING A MAIN OSCILLATOR CIRCUITRY AND SECONDARY OSCILLATOR CIRCUITRY

Yoshikazu Akahane, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jun. 30, 1977, Ser. No. 811,808
Claims priority, application Japan, Jun. 30, 1976, 51/77579; Jul. 8, 1976, 51/81357
Int. Cl.[2] G01R *21/12;* G04C *3/00;* H03B *3/04*
U.S. Cl. 58—23 AC **21 Claims**

1. An electronic timepiece comprising in combination a main oscillator means including a first time standard having a first temperature characteristic, said oscillator means being adapted to produce a first high frequency time standard signal having a

first predetermined frequency rate determined at least in part by the temperature characteristic of said first time standard, a second oscillator means including a second time standard having a second temperature characteristic, said second oscillator means being adapted to produce a second high frequency time standard signal having a second predetermined frequency determined at least inpart by the temperature characteristic of said second time standard, phase detection means for producing a phase detection signal in response to detecting a predetermined difference in phase between said first high frequency time standard signal and said second high frequency time standard signal, first divider means for producing a low frequency time signal, display means for displaying actual time in response to said low frequency time signal applied thereto, and frequency adjustment means coupled intermediate said phase detection means and said first divider means for adjusting the frequency of said low frequency signal produced by said first divider means in response to said phase detection signal being applied thereto.

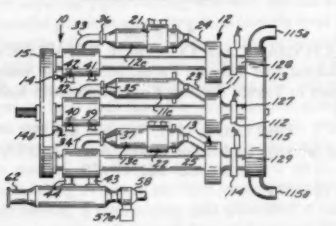


4,159,623

AUTOMOTIVE STEP-TURBINE ENGINE

William W. McReynolds, 6148 Elsa St., Lakewood, Calif. 90713

Filed Nov. 7, 1977, Ser. No. 849,336
Int. Cl.[2] F02C 7/02; F02D 25/00
U.S. Cl. 60—39.15 **29 Claims**



1. A step-turbine engine comprising in combination:

a. one or more primary gas turbine assemblies and one or more power boost gas turbine assemblies, said one or more primary turbine assemblies for supplying continuous engine power output when said engine is operating and said power boost turbine assemblies for successively augumenting said primary turbine assemblies as required by engine load conditions, each of said assemblies separately comprising in combination,

a radial-flow air compressor having an air inlet duct in a compressor housing front member of a compressor housing for admitting air into the compressor and having an outlet duct in the compressor housing rearwardly disposed from the inlet duct and disposed radially therefrom for discharging from the compressor high pressure compressed air therethrough,

an air-fuel mixture burner can having an air inlet sealably connected to the compressor outlet duct by a duct seal means for directing said high pressure air into a burner can combustion chamber portion having a fuel injection means for injecting fuel thereinto from a fuel delivery means for mixing said fuel with the air therein forming an air-fuel mixture, said chamber further having an electrical igniter means therein, said igniter means being energized by an electrical ignition control means, said igniter means for igniting said air-fuel mixture in said chamber, said can further having a hot gas expansion chamber portion rearwardly disposed from the combustion chamber portion for directing therethrough a high velocity gas ignition product, derived from ignition of the air-fuel mixture, and out thereof through a burner can outlet duct, said outlet duct being sealably connected by a seal clamp means to a gas turbine inlet duct for directing said gas product therethrough into a gas turbine,

the said gas turbine having said inlet duct coupled to the burner can outlet duct for directing the high velocity gas ignition product into a turbine wheel chamber of a turbine housing and impingingly against a plurality of radially extending turbine blades of a turbine wheel mounted therein for rotating said turbine wheel and a turbine power shaft to which the turbine wheel is fixedly and coaxially mounted, said shaft being rotatably and sealably mounted in sealed bearing and gas seal means at a turbine housing front end and at a turbine housing rearward end, said shaft further being rotatably drivingly coupled at a shaft forward extending end to a compressor rotor of said radial-flow air compressor through a shaft encircling compressor sealed bearing means mounted in a compressor rear housing member, said shaft further having fixedly and coaxially attached on a shaft rearward extending end a gear drive pinion for driving a drive gear of a reduction gear drive assembly, said turbine housing further having spent ignition product exhaust duct means for directing a spent ignition product therethrough and into an exhaust system for discharging said spent ignition product to the atmosphere.

b. the said reduction gear drive assembly having said gear drive pinion of each of the turbine assemblies being rotatably drivingly coupled to the said drive gear portion of said reduction gear drive assembly rotatably mounted within a reduction gear housing, said drive gear being coaxially with and rotatably drivingly coupled to a gear coupling member of a power output drive shaft of said reduction gear drive assembly for delivering rotational power to a rotatable load coupling member of said power output drive shaft, assembly, said drive shaft assembly having a front bearing mounting portion rotatably mounted within a front bearing means, said bearing means being mounted within a front bearing chamber portion of a housing front member, said shaft assembly having a rear bearing mounting portion rotatably mounted within a rear bearing means, said bearing means being mounted within a rear bearing portion of a rear housing member, said reduction gear drive assembly further including a load torque change indicating means for indicating changes in load torque of a load applied to said load coupling member;

c. a power demand sensor means for detecting changes indicated by said load torque change indicating means and converting said changes into an electrical power demand signal and conducting said demand signal to an electrical control means, said electrical control means step-wise successively energizing the one or more power boost gas turbine assemblies for augmenting power output of the continuously energized one or more primary power turbine assemblies as power output requirements increase by opening a fuel valve means in the said fuel delivery system, one valve for each power boost turbine assembly energized, thereby permitting fuel to be injected into the energized power boost turbine assemblies as said assem-

blies are successively energized in accordance with detected power demand requirements and further for stepwise closing successively said valves in the fuel delivery system as power output requirements are decreased and power augmentation is no longer required;

d. a mounting bar means for mounting compressor housings of each of the said turbine assemblies thereto, said bar further having means for mounting onto a front engine mounting means for front mounting the engine in a vehicle, said turbine housings for each of the turbine assemblies have rear mounting means for fixedly mounting the turbine assemblies to said front gear reduction housing member whereby gear teeth of the said pinion gears are inserted into said housing and mesh drivingly with said drive gear teeth thereby providing for synchronous rotation of rotating parts of said power boost turbine assemblies with rotating parts of said primary turbine assemblies, said reduction gear housing further providing a transmission mounting means on said rear housing member for mounting to a vehicle rear mounting means, and means for coupling said drive shaft coupling member to a conventional vehicle transmission; and

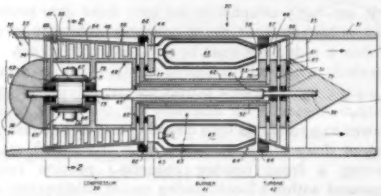
e. a starter means rotatingly drivingly coupled to said drive gear for rotating said drive gear for starting the engine upon opening a primary fuel valve of said fuel delivery means and energizing a primary burner can igniter means upon energizing said electrical ignition control means, and said electrical control means.

4,159,624

CONTRA-ROTATING ROTORS WITH DIFFERENTIAL GEARING

George P. Gruner, 13 Bradley Rd., Andover, Mass. 01810

Filed Feb. 6, 1978, Ser. No. 875,046
Int. Cl.² F02C *7/02*
U.S. Cl. 60—39.16 C **7 Claims**



1. A gas turbine power plant of the type having an elongated casing with an air intake end, a gas discharge end, a centrally located burner chamber, a compression stage between the air intake end and the burner chamber, a turbine stage between the gas discharge end and the burner chamber, a fixed shaft extending axially of said casing from said intake end to said discharge end, said plant characterized by;

an inner vaned rotor mounted on bearings supported on said shaft for rotation therearound said rotor having outward projecting spaced vanes in said compression stage and in said turbine stage rotatable as a unit;

an outer vaned rotor mounted on bearings supported on said shaft for rotation therearound, said rotor having inward projecting spaced vanes in said compression stage and in said turbine stage rotatable as a unit;

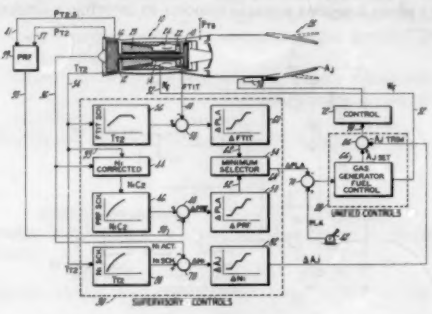
the vanes of said inner rotor alternating with the vanes of said outer rotor and being interdigited therewith and differential gear means operably connecting said inner vaned rotor to said outer vaned rotor to rotate in mutually opposite angular directions around said fixed shaft.

4,159,625

CONTROL FOR GAS TURBINE ENGINE

Walter B. Kerr, West Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 1, 1977, Ser. No. 764,610
Int. Cl.² F02K *3/02*; **F02C** *9/08*
U.S. Cl. 60—204 **9 Claims**



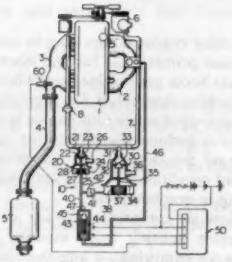
1. Control means for controlling a twin-spool gas turbine engine during a subsonic or transonic flight mode having variable area exhaust nozzle powering aircraft, said twin spool including a fan driven by a low turbine, and a compressor driven by a high turbine, and burner means for generating hot gases for driving said turbine, engine control means independently controlling the flow of fuel to said burner and controlling the area of said variable exhaust nozzle, said control means including means responsive to a pressure ratio across a station in said engine for generating a first signal, means responsive to engine rotor speed and engine inlet temperature for generating a second signal indicative of a schedule of said pressure ratio, means responsive to said first signal and said second signal for generating a third signal indicative of pressure ratio error, and means responsive to a function of said third signal for generating a fourth signal for biasing said independent engine control means to further adjust said fuel flow to maintain the pressure ratio schedule of said second signal.

4,159,626

SECONDARY AIR CONTROL VALVE DEVICE

Norio Shibata, and Tatsumi Furukubo, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 4, 1977, Ser. No. 839,290
Claims priority, application Japan, Aug. 27, 1977, 52-102185
Int. Cl.² F01N *3/10*
U.S. Cl. 60—276 **10 Claims**



1. A secondary air control device disposed in a system for supplying secondary air into an exhaust system of an internal combustion engine, which exhaust system is provided with a catalytic converter for purifying exhaust gas emitted from said engine, said secondary air control device being actuated by an

ON-OFF vacuum signal for controlling the amount of said secondary air supplied, wherein said secondary air control device is characterized by:

a first valve means actuated by said ON-OFF vacuum signal for stepwisely controlling the flow of secondary air in response to said ON-OFF vacuum signal, and;

a second valve means, which is a delay system with a predetermined delay time, actuated by said ON-OFF vacuum signal for controlling the flow of secondary air,

whereby said secondary air control device can control the flow of secondary air, which comprises a step flow generated by said first valve means and a delayed flow generated by said second valve means, in accordance with said ON-OFF vacuum signal.

4,159,627

EXHAUST PIPE FOR AN INTERNAL COMBUSTION ENGINE

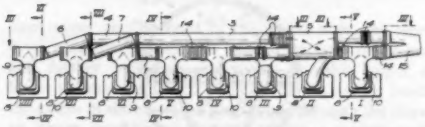
Werner Mönch, Ilvesheim, and Walter Ziemer, Viernheim, both of Fed. Rep. of Germany, assignors to Motoren-Werk Mannheim AG vorm. Benz Abt. Stat. Motorenbau, Mannheim, Fed. Rep. of Germany

Filed May 20, 1977, Ser. No. 799,122

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1976, 2625788

Int. Cl.[2] F01N *7/10*

U.S. Cl. 60—322 **7 Claims**



1. An exhaust arrangement for connecting an exhaust gas outlet of each of a plurality of in-line cylinders of a turbo-supercharged internal combustion engine to a turbine of an exhaust-gas turbo-supercharger, the exhaust arrangement comprising: four separate pipes having first and second ends and including parallel portions extending rectilinearly over a major part of the lengths of the pipes, the pipes being arranged so that the axes of said parallel portions are located at the corners of a substantially equal sided quadrilateral having one side positionable adjacent said gas outlets and an opposite side positionable remote from said gas outlets; a plurality of branch, pipes each of said branch pipes connecting the exhaust-gas outlet of each cylinder to one of said first-mentioned pipes, each of said branch pipes leading to one of the two corners of said one side of the quadrilateral; a connecting part provided is said first-mentioned pipes intermediate said first and second sides; and upstream and downstream parts of said first-mentioned pipes interconnected by said connecting part, said connecting part being arranged to twist said first-mentioned pipes whereby the parallel portions of said upstream part and associated with said opposite side of the quadrilateral communicate with the parallel portions of said downstream part and associated with said one side of the quadrilateral; an expansion member positioned in each of said first-mentioned pipes between junctions of said branch pipes; two of said first-mentioned pipes leading to two cylinders farthest from an outlet of said first-mentioned pipes extending obliquely from respective branch pipes to two corners of said opposite side of said quadrilateral; said connecting part being an integral uniform casting comprising helically twisted dividing walls arranged in form of a cross and one outside wall, said connecting part having an axial extent only in the region of one cylinder and connecting to only one of said branch pipes; said branch pipes comprising a plurality of pairs of pipe members of substantially equal length.

4,159,628

TORQUE CONVERTER WITH AN IMPROVED HOUSING CONSTRUCTION

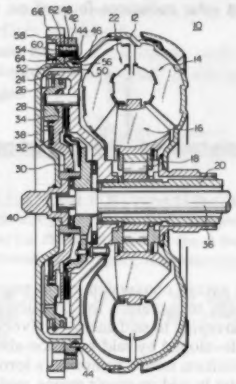
Kazuyoshi Hiraiwa, Ome, and Kotei Takahashi, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 14, 1977, Ser. No. 815,942

Claims priority, application Japan, Jul. 14, 1976, 51-92729[U]

Int. Cl.[2] F16D *33/00*; F16L *23/00*

U.S. Cl. 60—364 **6 Claims**



1. A torque converter having first and second housings which are respectively formed with first and second open ends connectable with each other to form therein an enclosed chamber, said first housing being provided at the inner surface thereof with a plurality of blades forming an impeller and said second housing being firmly connected to an engine driven shaft to be rotatable therewith, said torque converter comprising:

a first annular portion forming said first open end of said first housing;

a second annular portion forming said second open end of said second housing and including a first cylindrical section snugly disposed in said first annular portion, and a second cylindrical section the diameter of which is smaller than that of said first cylindrical section thereby forming a step portion between said first and second cylindrical sections;

a first ring member firmly and coaxially mounted on said first annular portion;

a second ring member coaxially but snugly mounted on said second cylindrical section and formed at the outer cylindrical surface thereof with a plurality of external teeth which are adapted to be meshingly engaged with an engine starter gear, the inner diameter of said second ring member being smaller than the outer diameter of said first cylindrical section;

a sealing member disposed between said first annular portion and said first cylindrical section; and

means for detachably connecting said second ring member to said first ring member in such a manner that said second ring member abuts upon the step portion.

4,159,629

APPARATUS FOR THE COLLECTION AND CONVERSION OF SOLAR ENERGY

Abraham L. Korr, Philadelphia, Pa.; Evan H. Walker, Aberdeen, Md., and Bernard T. Svihel, Laverock, Pa., assignors to A. L. Korr Associates, Inc., Philadelphia, Pa.

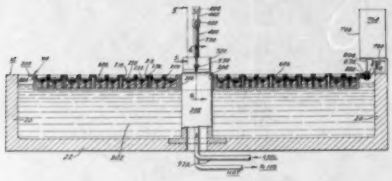
Filed Mar. 30, 1977, Ser. No. 783,069

Int. Cl.[2] F03G *7/02*; F24J *3/02*

U.S. Cl. 60—641 **22 Claims**

16. In combination with a farm irrigation system comprising

pump means for pumping irrigation water and water reservoir means for storing irrigation water, and an energy source for operating said pump means, the improvement wherein said energy source comprises at least one array of solar radiation reflectors for focusing solar radiations in the region of the foci of said reflectors, radiation-absorbent means positioned at said foci for developing thermal energy in response to said focused solar radiations, common platform means supporting said reflectors and said radiation-absorbent means, means for rotating said platform means about a substantially vertical axis to cause said reflectors to track the apparent daytime motion of the sun and maintain said solar radiations focused on said radiation-



absorbent means, energy conversion means responsive to thermal energy of high temperature for producing useful work, and means for conveying to said energy conversion means said thermal energy developed by said radiation-absorbent means;

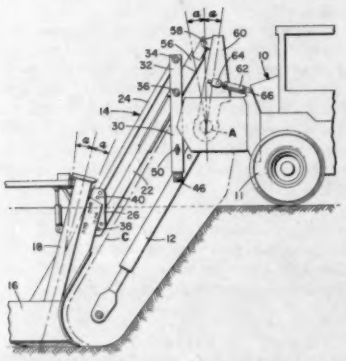
wherein said platform means comprises a toroidal boat floating upon water in said reservoir means, said energy source also comprising column means extending from the earth to said platform means for stabilizing it against tilt and against lateral motion, said column means extending slidably into the opening in the center of said boat, whereby said boat can rise and fall in accordance with the changes in the level of said reservoir water.

4,159,630

ASSEMBLY SUCH AS FOR A TILE CHUTE TOOL FOR USE WITH A DITCHING OR TRENCHING MACHINE

Kenneth W. Schuermann, Perry, Okla., assignor to The Charles Machine Works, Inc., Perry, Okla.

Filed Aug. 2, 1977, Ser. No. 821,308
Int. Cl.[2] F16L *1/02*
U.S. Cl. 405—174 **4 Claims**



1. An assembly such as for a tile chute tool to be attached to the digging boom and mobile chassis of a ditching or trenching machine comprising:

a four-bar linkage in the form of a parallelogram having an element such as a tile chute tool carried by one of the members of said linkage,

means for pivotally connecting said linkage to the mobile chassis of the machine, said connecting means extending from said linkage for attachment to a tiltable control lever supported relative to the mobile chassis of the ditching or trenching machine,

extensible means for pivotally connecting said linkage to the digging boom, said extensible means including a pair of parallel telescoping arms, two of the members of said four-bar linkage extending between said arms and being pivotally connected to said arms at spaced positions defining a portion along the length of each of said pair of arms which portion forms another member of said linkage, said two of the members being pivotally connected at spaced positions on the linkage member carrying said element, and

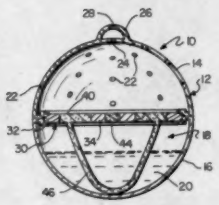
releasable means associated with said extensible means to retain it at a fixed length against extending movement to retain the boom and said linkage in a predetermined operating relationship to each other but being releasable to permit the boom to proceed with digging independent of the assembly position.

4,159,631

PERFUMED VAPOR DISPENSING JEWELRY

Ki S. Lee, 1010 Fanshawe St., Philadelphia, Pa. 19111

Filed Jun. 1, 1978, Ser. No. 911,490
Int. Cl.[2] A61L *9/04*
U.S. Cl. 63—1 R **10 Claims**



1. An article of jewelry for dispensing perfumed vapors, the combination comprising:

a hollow housing having upper and lower portions coupled together to form said housing, said lower portion forming a reservoir for containing a quantity of perfume;

coupling means attached to said housing for coupling the jewelry to another object;

a central disc located inside said housing;

support means for supporting said disc in said housing;

a plurality of orifices located in said housing upper portion through which perfumed vapors may exit;

a central orifice located in said housing upper portion through which perfume may be introduced into said housing;

said disc having a plurality of cutouts, each said cutout being filled with absorbent material; and

wick means extending from said absorbent material into said lower portion.

4,159,632

AUTOMATIC CLEANING APPARATUS

Frederick W. Grantham, 12055 Goshen Ave., Los Angeles, Calif. 90066

Filed Nov. 22, 1976, Ser. No. 743,965
Int. Cl.[2] D06F *15/00*
U.S. Cl. 68—9 **28 Claims**

1. Automated laundry apparatus, which comprises:

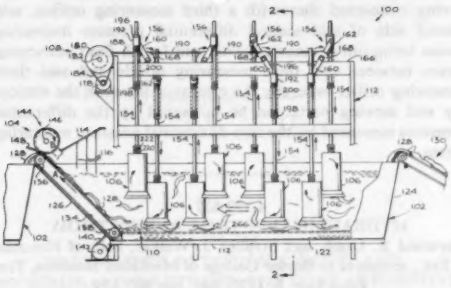
at least one tank adapted for containing a liquid and articles to be laundered;

a plurality of plungers movable relative to the tank for processing articles within the tank, said plungers comprising a piston, a cylinder encasing said piston and axially mov-

able relative thereto, and means for engaging the cylinders by the pistons to cause movement of the cylinders by movement of the pistons;

means for selectively driving the plungers to process said laundry articles including a plurality of piston rods, each coupled to an associated piston, for driving the plungers in generally vertical reciprocating motion relative to the tank and means for driving the plungers in a selected phase relationship relative to each other;

the driving means further including a rotatable crank having rotatably connected to each opposite end portion thereof an upper end portion of one of the piston rods, the end portions of the crank being laterally offset on a crankshaft, and a driving member affixed to a central portion of the crankshaft; the crank having sleeves slidably mounted



over upper end portions of the piston rods, the sleeves being rotatably mounted to the end portions of the crank and further including selectively movable upper and lower slidable stops affixed to each piston rod for limiting the extent of sliding of the piston rods through the sleeves, an upper stop being mounted above a corresponding sleeve and a lower stop being mounted below the corresponding sleeve, and a compression spring installed around each connecting rod between a lower portion of the sleeve and the lower stop, the spring thereby biasing the associated piston rod downwardly;

means for rotatably driving the driving member to thereby cause rotation of the crank and reciprocating motion of the piston rods connected thereto; and

control means for controlling the driving means.

4,159,633

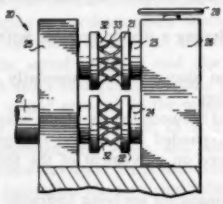
METALLIC ROD PRODUCT, AND METHOD FOR PRODUCING SAME

Robert S. Linne, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Division of Ser. No. 749,570, Dec. 10, 1976, Pat. No. 4,087,898, which is a continuation-in-part of Ser. No. 598,976, Jul. 24, 1975, abandoned, which is a division of Ser. No. 543,058, Jan. 22, 1975, abandoned. This application Feb. 9, 1978, Ser. No. 876,400

Int. Cl.[2] B21H *8/02*

U.S. Cl. 72—198 **5 Claims**



1. Apparatus for producing an improved metallic rod product intended for subsequent drawing into wire through a die comprising:

means for providing a smooth surfaced metallic rod product substantially free of protrusions at a hot-forming temperature,

means for passing the rod product in rolling relation between rotating roll means having surfaces characterized by a number of protrusions extending outwardly from a rod rolling surface which is otherwise substantially smooth so that the exterior surface of said rod product is formed to a texture complementary to the texture of the rolling surfaces of said rolls,

said roll means having a rod rolling surface which is uniformly covered with a network of substantially interconnected ridges.

4,159,634

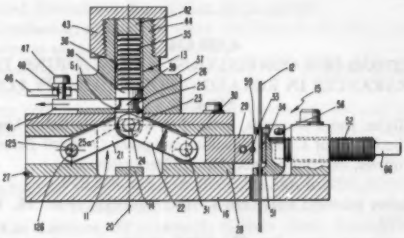
TOGGLE MECHANISM FOR PINCHING METAL TUBES

Edwin O. Stengard, College Park, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 19, 1978, Ser. No. 909,100

Int. Cl.[2] B21J *7/00;* **F16L** *15/10*

U.S. Cl. 72—436 **8 Claims**



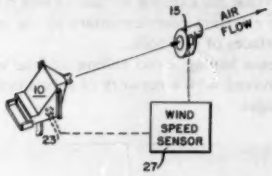
1. Apparatus for pinching a metal tube and for maintaining the tube in a pinched condition without fracturing the tube comprising a stop block against which a first side of the tube bears, a toggle mechanism including: a plunger translatable along a longitudinal axis, a first link having a longitudinal axis and first and second ends respectively pivoted about a fixed first axis at right angles to the longitudinal axis of the plunger and a second axis through the plunger, the first and second axes being parallel to each other, a second link having a longitudinal axis and a first end pivoted about the second axis and a second end free to translate along a line at right angles to the longitudinal axis of the plunger and the second axis, a push link extending from the free end of the second link toward a second side of the tube opposite from the first side, said toggle mechanism having an initial position so the second axis is at first position on one side of an aligned position for the longitudinal axes of the first and second links and a free end of the push link is proximate the second side of the tube; a stored, potential energy source for suddenly and irreversibly driving the plunger along its longitudinal axis so the second axis is at a second position slightly on the other side of the aligned position for the longitudinal axes of the links and the free end of the push link abuts against the second side of the tube to pinch the second side of the tube against the first side of the tube; and means for limiting the longitudinal translation of the plunger so the second axis remains at the second position and the free end of the push link remains abutted against the second side of the tube to continue to pinch the second side of the tube against the first side of the tube.

4,159,635

ISOKINETIC AIR SAMPLER

George A. Sehmel, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 24, 1978, Ser. No. 936,461
Int. Cl.[2] G01N *15/00*
U.S. Cl. 73—28 6 Claims



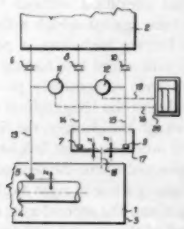
1. An isokinetic air sampler comprising a filter, a holder for the filter, means for drawing air through the filter at a fixed, predetermined rate, an inlet assembly for the sampler having an inlet opening therein of less cross-sectional area than the filter, the size of the opening being such that isokinetic air sampling is obtained at a particular air speed, a closure for the inlet opening and means for simultaneously opening the closure and operating the means for drawing air through the filter when the air speed is such that isokinetic air sampling is obtained.

4,159,636

METHOD FOR CONTINUOUSLY MONITORING THE CLEARANCES IN ROTATING EQUIPMENT BY FLOW MEANS

Jan Jicha; Karel Kopecek, both of Brno, and Bretislav Langer, Zebetin, all of Czechoslovakia, assignors to Prvni Brnenska strojirna, narodni podnik, Brno, Czechoslovakia

Filed Apr. 12, 1978, Ser. No. 895,599
Claims priority, application Czechoslovakia, Apr. 16, 1977, 2513/77
Int. Cl.[2] G01B *13/12*
U.S. Cl. 73—37.6 2 Claims



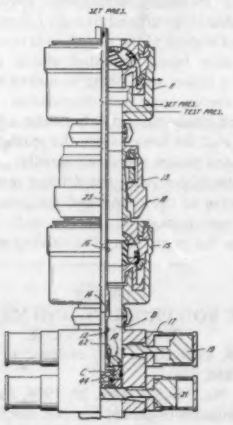
1. An apparatus for the continuous measurement of clearances, gaps and feeds between moving and stationary machine parts which comprises three paths for compressible fluid flow between a first pressure area between the moving part, whose clearance is to be monitored and the stationary part, to a second pressure area, said first flow path comprising a first measuring nozzle mounted on the stationary part with its orifice facing the moving part, a first conveying means connected to said first measuring nozzle for conveying the compressible fluid between the first pressure area to said second area, said first conveying means having a first measuring orifice mounted therein between the measuring nozzle and the second pressure area and having a first side of a first differential pressure measuring means interconnected with said first conveying means between the first measuring nozzle and the first measuring orifice, a second fluid conveying means open to the fluid in the area between the moving part and the stationary part, which clearance is to be monitored; a second measuring nozzle mounted with its orifice facing in a surface and adapted to convey a portion of the fluid in said second fluid conveying means through a third fluid conveying means between the second pressure space and the first pressure space, said third fluid conveying means having connected therewith a second side of said first differential pressure measuring means and a first side of a second differential pressure measuring means interconnected with said third fluid conveying means between said second measuring nozzle and said orifice of said second measuring nozzle; a third measuring nozzle mounted with its orifice facing a surface and adapted to convey a portion of the fluid in said second fluid conveying means through a fourth fluid conveying means between the second pressure space and the first pressure space, said fourth fluid conveying means having connected therewith a third measuring orifice, said second side of said second differential pressure measuring means being interconnected with said fourth fluid conveying means between said third measuring nozzle and said third measuring orifice whereby the clearance between the stationary and moving parts can be measured by the differential pressures measured by the two differential pressure measuring means.

4,159,637

HYDRAULIC TEST TOOL AND METHOD

Raymond K. Lamb, and Stephen J. Walker, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Filed Dec. 5, 1977, Ser. No. 857,159
Int. Cl.[2] G01M *3/28*
U.S. Cl. 73—46 15 Claims



1. A test tool for hydraulic testing of apparatus having a bore and a landing area comprising,

a housing adapted to fit within the bore,

means on the housing for connection to pipe having a passage therethrough for lowering and raising the housing in the bore,

the housing including a sleeve movable with respect to the housing,

the housing and sleeve having annularly extending and facing shoulders,

packing disposed between the shoulders adapted to be compressed and expanded into sealing engagement with the cylindrical bore on movement of the shoulders toward each other,

means in the housing for applying hydraulic pressure to the sleeve,

a landing surface on the housing adapted to land on the

landing surface in the bore restricting downward movement of the housing after such landing,

a passage in the housing communicating with the passage in the string of pipe and with the means for applying hydraulic pressure to the sleeve,

a pressure-relief valve disposed on the housing above the packing operable to open at a pre-determined pressure and being in fluid communication with the passage in the housing,

whereby the test tool can be lowered in the bore, landed on the landing area in the bore, hydraulic pressure then applied in the passages in the pipe and thus in the housing, a seal effected in the bore by the packing, and hydraulic testing pressure applied to the bore above the packing through the relief valve.

4,159,638

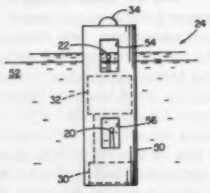
THERMISTOR DETECTOR CIRCUIT AND DISCRIMINATING NETWORK FOR HEAT ABSORPTIVE MEDIA

Bronson M. Potter, R.F.D. 1, Greenville, N.H. 03048

Continuation-in-part of Ser. No. 752,199, Dec. 20, 1976, Pat. No. 4,116,045, and a continuation-in-part of Ser. No. 785,347, Apr. 7, 1977. This application Aug. 18, 1977, Ser. No. 825,670

Int. Cl.[2] G01N *25/18*; G01F *1/00*; G01W *1/00*

U.S. Cl. 73—61.1 R **20 Claims**



1. A detector to discriminate at least one condition from a set of two or more different conditions of a heat absorptive medium that are related to heat transfer properties, comprising an electrical sensing network that includes a set of monitoring elements corresponding to the number of said conditions, each said element of said set disposed in a different relationship to said set of conditions and each said element having an electrical characteristic that changes as a single valued function of temperature, a restorative energizing circuit supplying heating power to said overall network, said circuit including reference means representing a predetermined desired value for the electrical characteristic of said overall network and responsive to change in the actual value of said characteristic of said overall network from said predetermined value to vary the flow of power to said network in the manner to restore said actual value of said characteristic of said overall network toward said predetermined value, and means to derive an output signal dependent upon the actual values of said characteristics of said individual elements and related to the thermal loss of each of said individual elements to said medium, and indicating said one condition.

4,159,639

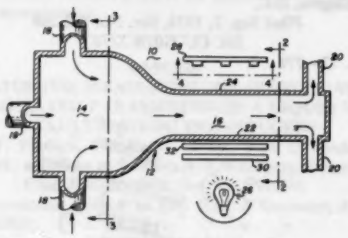
APPARATUS AND METHOD FOR MEASURING THE DEGREE OF REFINING OF PULP FIBERS IN THE PREPARATION OF FURNISH FOR PAPER MAKING

Romilly J. Simms, Menlo Park, and Byron K. Madsen, Saratoga, both of Calif., assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1977, Ser. No. 852,817

Int. Cl.[2] G01N *15/04*

U.S. Cl. 73—63 **11 Claims**



1. The method of measuring the quality of a refined pulp suspension comprising the steps of:

preparing a sample of the refined pulp suspension having a preselected consistency which is less than normal consistency;

agitating the sample so that the fibers are uniformly distributed throughout the volume of the sample;

discontinuing agitation to allow the fibers in the pulp suspension to settle;

measuring a descent characteristic of the fiber-water interface in the pulp suspension; and

using that descent characteristic to determine the quality of the pulp suspension.

4,159,640

APPARATUS FOR MEASURING THE CONSISTENCY OR HARDNESS OF A MATERIAL

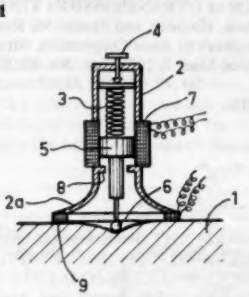
Jean-Luc Lévéque, Montfermeil; Gilbert Gras, Aulnay-Sous-Bois, and Jean Scot, Paris, all of France, assignors to L'Oreal, Paris, France

Filed Mar. 1, 1978, Ser. No. 882,163

Claims priority, application France, Mar. 4, 1977, 77 06505

Int. Cl.[2] G01N *3/42*

U.S. Cl. 73—81 **14 Claims**



1. Apparatus for measuring the hardness of a material by application of the apparatus against the material to be tested, comprising (a) a support (b) feeler means carried by said support for displacement relative to said support, (c) means for causing said feeler means to bear on the said material with a predetermined force; (d) a pressure sensor carried by said support for sensing the bearing pressure of the apparatus on said material and for providing an output signal indicative of the sensed pressure, and (e) means for selectively and automatically detecting the displacement of the feeler means only for a predetermined value P_O of the bearing pressure of the appara-

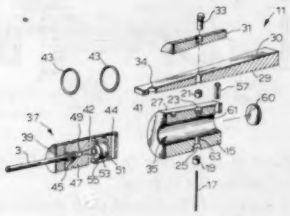
tus on the material sensed by the pressure sensor, said means comprising, means for comparing the output signal of the pressure sensor with a predetermined threshold and for actuating an indicator to indicate the detected displacement of the feeler means when said output signal reaches the threshold.

4,159,641

VIBRATING WIRE STRESS METER

Ivor Hawkes, Lyme, N.H., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sep. 3, 1974, Ser. No. 502,265
Int. Cl.[2] G01B *7/16*
U.S. Cl. 73—778 **6 Claims**



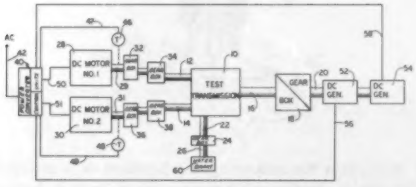
1. A combined vibrating wire stress meter and mount assembly comprising:
an elongated cylinder having a major hollow inner portion which extends substantially the entire length thereof;
a highly tensioned wire transversely intersecting said hollow portion, said wire being anchored into opposite walls of said cylinder by two tubes which have been extruded over the opposite ends of said wire;
electromagnetic actuating means contained in said hollow cylinder portion for causing said wire to vibrate at a known frequency, said actuating means being capable of detecting variations from said known frequency caused by forces acting on the cylinder; and
means for fixedly mounting said cylinder into a borehole, said mounting means being in contact with the outer surface of the cylinder.

4,159,642

AIRCRAFT TRANSMISSION TEST SET

George S. Hudson, Hamden, and Madan M. Roy, Milford, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Mar. 2, 1978, Ser. No. 882,870
Int. Cl.[2] G01M *13/02*
U.S. Cl. 73—118 **8 Claims**



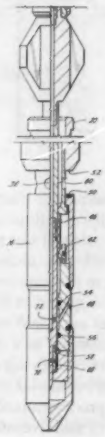
1. A test set for performing life cycle measurements on a large sized transmission having ratio changing gearing therein, said transmission including at least one input shaft, each such input shaft being useful for receiving driving power from an engine source, said transmission including both a main output shaft and an auxiliary output shaft, said test set comprising:
at least one variable speed DC motor, each of said motors having voltage input terminals and having an output shaft, said output shaft being connected by first coupling means to an input shaft of said transmission, each of said motors being sized to equal the full load power rating of the transmission input shaft to which said motor is coupled;
a power converter having as many sets of DC voltage output terminals as there are DC motors, each of such sets of terminals encircuited with the input terminals of each of said variable speed DC motors, the input of said power converter being encircuited with a prime power source;
means for monitoring the rotational speed of each of said motor output shafts, said means including generation of a voltage output signal whose parameters are proportional to the rotational speed of said motor output shaft, said output signal being encircuited to provide a feedback control voltage to said power converter for use in correcting the speed of each of said DC motors;
power absorbing means coupled to the auxiliary output shaft of said transmission for loading the auxiliary output to its full rated value; and
generator means drivingly coupled to the main output shaft of said transmission, said generator means being sized to equal the full power rating of said transmission, said generator means having output terminals for supplying electric energy to a load, said load serving to load down said transmission, the magnitude of said load being adjustable by control of the field current of said generator means, the output terminals of said generator means being encircuited to supplement the power drain from said prime power source whereby the net system power consumption is only the amount needed to overcome test set and transmission internal losses.

4,159,643

METHOD OF AND APPARATUS FOR MEASURING BOTTOM HOLE WELL PRESSURE

Fred E. Watkins, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Jul. 31, 1978, Ser. No. 929,154
Int. Cl.[2] E21B *47/06*
U.S. Cl. 73—155 **12 Claims**



1. A method of measuring bottom hole pressure in the tubing of a well comprising
install an isolation assembly in the tubing by a locking seal device, said assembly including first and second ports in communication between the interior of the assembly and the interior of the tubing, said first port being open for flowing through the first port,
releasably install a sensor prong in the isolation assembly

including a pressure measuring instrument which is connected to the prong,

close the first port in the assembly by actuation of the prong,

measuring through the second port the pressure below the assembly by the pressure measuring instrument,

after completion of the measurement, retrieve the measuring instrument.

4,159,644

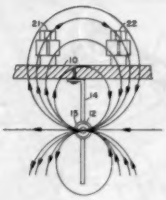
SHIP'S LOG AND SPEEDOMETER

Carl G. Svala, 79 William St., Norwalk, Conn. 06851

Filed May 15, 1978, Ser. No. 906,075

Int. Cl.[2] G01C *21/10*

U.S. Cl. 73—187 **15 Claims**



7. A ship's log for measuring the distance traveled by a vessel through water comprising:

a rotator assembly adapted to be mounted outside the hull of a vessel and below its water line, said assembly comprising a shaft, low-friction bearing means supporting said shaft, a vaned rotator for turning said shaft in response to movement through the water, and a permanent magnet affixed to said shaft with its axis of magnetization oriented in a plane substantially at right angles to said shaft;

a balanced pair of magnetometers adapted to be mounted inside the hull of said vessel substantially in said plane and substantially equidistant from said shaft, said magnetometers being in sufficiently close proximity to said magnet to respond to its magnetic field;

electrical circuit means for providing energizing current to said magnetometers and interconnecting them so that their output signals due to said field are added electrically; said magnetometers and circuit means generating a resultant electrical signal that has cyclic variations which are a direct function of the rotation of said magnet; phase detection means energized by said circuit means for detecting phase reversals in said signal due to said rotation;

digital means for counting and displaying the number of phase reversals with the proper scaling factor, as determined by the pitch of said vaned rotator, thereby to represent the nautical distance travelled by said vessel through the water.

4,159,645

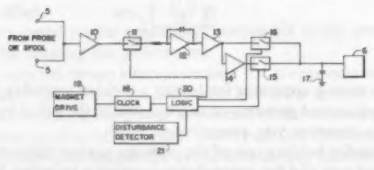
ELECTROMAGNETIC FLUID FLOW METER WITH TOLERANCE TO SPURIOUS SIGNALS

Vincent J. Cushing, Northbrook, Ill., assignor to Monitek, Inc., Redwood City, Calif.

Filed Nov. 11, 1977, Ser. No. 850,521

Int. Cl.[2] G01F *1/58*

U.S. Cl. 73—194 EM **16 Claims**



1. An electromagnetic flow meter for measuring fluid flow velocities by use of electromagnetically induced voltages having a signal processing chain including sensing electrodes and an amplifier coupled thereto, a sampling switch coupled to said amplifier for sampling said amplifier, signal processing means coupled to said sampling switch, a phase sensitive demodulator coupled to said signal processing means and at least one utilization circuit coupled to said phase sensitive demodulator, wherein the improvement comprises means for disabling said demodulator in the presence of spurious signals and a storage device for providing to said utilization circuit a signal representative of flow velocity prior to the disablement of said phase sensitive demodulator.

4,159,646

APPARATUS FOR MEASURING THE FLOW QUANTITY OR ASSOCIATED PARAMETERS OF A LIQUID WITH TWO ULTRASONIC TRANSDUCERS

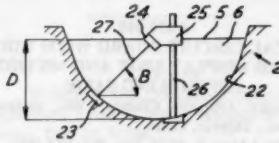
Mogens T. Paulsen, and Bertel Birker, both of Sonderborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Jan. 20, 1978, Ser. No. 870,990

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703439

Int. Cl.[2] G01F *1/66*

U.S. Cl. 73—194 A **2 Claims**



1. Apparatus for measuring the flow quantity or associated parameters such as depth of liquid and mean flow speed of a liquid flowing with a free surface in a channel, comprising, a channel through which a liquid is flowable, two ultrasonic transducers operating alternately with respect to each other as transmitter and receiver, one of said transducers being mounted in the defining wall of said channel below the intended surface level of said liquid, a float member floatable on the surface of said liquid, said other transducer being mounted on said float member, said float member being positioned so that said transducers are spaced from each other and form between each other a measuring path with a component in the direction of flow, a measuring circuit for determining the transit times of the ultrasonic waves in both directions, an evaluating circuit for determining the desired quantities with regard to said transit times, and each said transducer emitting a sound cone with a sufficient aperture angle so that within the range of expected liquid level fluctuations the receiving transducer is still within the reflection space of the emitting sound cone.

4,159,647

APPARATUS FOR MEASURING THE FLOW QUANTITY OR ASSOCIATED PARAMETERS OF A LIQUID WITH TWO ULTRASONIC TRANSDUCERS

Mogens T. Paulsen, and Bertel Birker, both of Sonderborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Jan. 20, 1978, Ser. No. 870,991

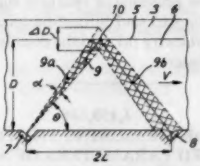
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703439

Int. Cl.[2] G01F *1/66*

U.S. Cl. 73—194 A **7 Claims**

1. Apparatus for measuring the flow quantity or associated parameters such as depth of liquid and mean flow speed of a liquid flowing with a free surface in a channel, comprising, a channel through which a liquid is flowable, two ultrasonic transducers operable alternately with respect to each other as

transmitter and receiver, said transducers being mounted in longitudinally spaced relation to each other in the defining wall of said channel below the intended surface level of the liquid, said transducers being mutually positioned and directed so that the effective measuring path therebetween is reflected from the underside of the liquid surface level and has components in the vertical direction and in the direction of flow, a



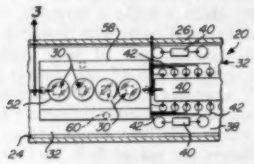
measuring circuit for determining the transit times of the ultrasonic waves in both directions, an evaluating circuit for determining the desired quantities with regard to said transit times, and each said transducer emitting a sound cone with a sufficient aperture angle so that within the range of expected liquid level fluctuations the receiving transducer is still within the reflection space of the emitting sound cone.

4,159,648

ELECTRICAL CIRCUIT BOARD WITH DIRECTLY ATTACHED DISPLAY UNIT AND METHOD OF ASSEMBLING SAME

Howard S. Prosky, Arapahoe County, Colo., assignor to Electromedics, Inc., Denver, Colo.

Filed Nov. 3, 1977, Ser. No. 848,090
Int. Cl.[2] G01K *7/00*
U.S. Cl. 73—362 AR **13 Claims**



11. An electronic thermometer utilizing an electrical circuit assembly therein, said electrical circuit assembly comprising:

at least one display unit including a plurality of individual light emitting elements, said light emitting elements each include light emitting diode segments,

an electrical circuit board having a component mounting surface of substantially larger area than said display unit,

means for directly and permanently affixing said display unit to the component mounting surface of said circuit board,

a plurality of electrical conductors permanently attached to the component mounting surface of said circuit board, at least a few of said electrical conductors being positioned on said component mounting surface proximate to said display unit, and at least a few of said electrical conductors extending to positions on said component mounting surface separated from said display unit,

means for electrically connecting each light emitting diode segments of said display unit to an electrical conductor attached proximate to said display unit,

at least one electronic component other than said display unit positioned on said component mounting surface of said circuit board and separated from said display unit, said electronic component including at least one electrical lead conductor extending therefrom, and

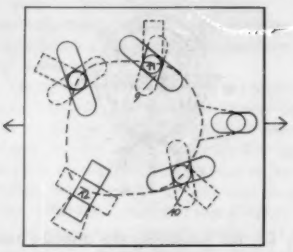
means electrically connecting said component lead conductor to at least one electrical conductor attached to said circuit board at a position separated from said display unit.

4,159,649

APPARATUS FOR THE GENERATION OF SPECIFIED DEFORMATIONS IN SPECIMEN

Eckard Feldmann, Feldstedter Weg 6, D 1 Berlin 49, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 813,752
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1976, 2645474
Int. Cl.[2] G01N *3/08*
U.S. Cl. 73—788 **8 Claims**



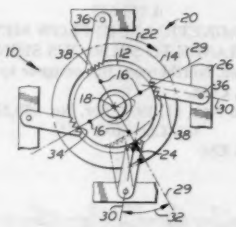
1. Apparatus for the generation of definite homogeneous and nonhomogeneous deformations in a specimen, the apparatus consisting of bars and plates having parallel bordered slots, characterized by two pairs of plates, each of the plates of one pair belonging to a different class, the two classes differing by the geometry of slots, the plates being parallel to each other, slots belonging to different classes of plates corresponding one to one and intersecting in the projection onto a plane parallel to the plates, bars put through the intersection of corresponding slots, the bars being attached to the specimen, having an axis in the region of slots being collinear with a line in the surface of the specimen if the specimen is deformed nonsymmetrically relative to the bar, the operation of the device results in a definite deformation of the specimen if the plates of the two classes are displaced relative to each other.

4,159,650

WELD TESTING APPARATUS

Roy L. Maguire, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 26, 1978, Ser. No. 909,758
Int. Cl.[2] G01N *3/22*
U.S. Cl. 73—847 **6 Claims**



1. A testing apparatus for testing a welded assembly having first and second portions connected one to the other by welds about a common axis, comprising:

means for holding one of the portions against rotation about said axis and for controllably exerting a torquing force of a preselected magnitude on the other portion, said torqu-

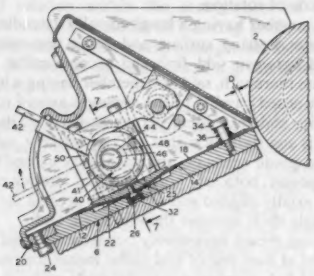
ing force being about said axis and oriented relative to said one of the portions for controllably exerting a radial force component of a preselected magnitude through each of said welds.

4,159,651

FLEXURE POSITIONING MECHANISM

John MacPhee, Rowayton, Conn., assignor to Baldwin-Gegenheimer Corporation, Stamford, Conn.

Filed May 9, 1977, Ser. No. 795,368
Int. Cl.[2] F16H *25/08*
U.S. Cl. 74—55 **14 Claims**



1. A positioning mechanism comprising:
(a) a stationary base member;
(b) means including contoured blocks on said base in spaced apart relationship, said blocks being contoured so that the upper surfaces thereof curve toward one another;
(c) a flexure beam positioned on the upper surfaces of said contour blocks;
(d) means fixedly attaching one end of said flexure beam to one of said contour blocks, the other end of said flexure beam being a free end and extending beyond the other contour block;
(e) means limiting the movement of the free end of said flexure beam to rectilinear movement;
(f) means located between said contour block for flexing said flexure beam to thereby cause rectilinear movement of said free end of the flexure beam.

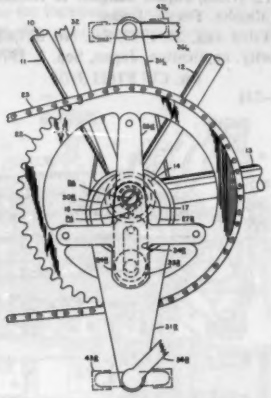
4,159,652

BICYCLE DRIVE ASSEMBLY

Earl M. Trammell, Jr., St. Louis, Mo., assignor to Cycle-Drive Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 417,060, Nov. 19, 1973, Pat. No. 3,906,807. This application May 31, 1977, Ser. No. 802,130
Int. Cl.[2] F16H *29/04*
U.S. Cl. 74—117 **6 Claims**

1. A drive assembly for a physically propelled vehicle, comprising:
(a) a drive member rotatively mounted on a drive axis,
(b) a crank arm operatively connected to the drive member for rotating the drive member,
(c) a power arm rotatively mounted on a power axis for relative angular movement between the power arm and crank arm, the drive axis and power axis being relatively offset,
(d) a pedal means operatively connected to the power arm for rotating the power arm,
(e) control means interconnecting the power arm and crank arm for rotating the crank arm and drive member, and for accelerating the power arm ahead of the crank arm during one portion of the crank arm cycle and decelerating the power arm behind the crank arm during another portion of the crank arm cycle, and
(f) power-adjusting means connected to the power arm for moving the power axis relative to the drive axis for changing the point in the cycle of the crank arm when the acceleration and deceleration of the power arm occurs.

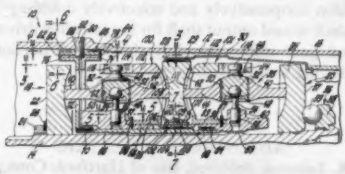


4,159,653

TORQUE-EQUALIZING MEANS

Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 5, 1977, Ser. No. 839,649
Int. Cl.[2] F16H *15/32, 15/36, 15/38*
U.S. Cl. 74—200 **4 Claims**



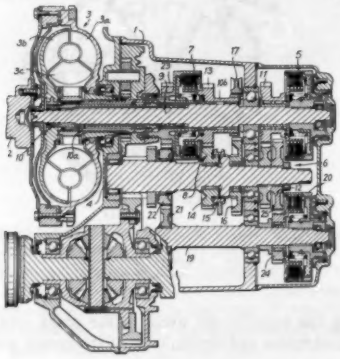
1. In a transmission including a housing, input means, output means, and dual traction drive transmission sections operatively connected therebetween, each of the sections including input and output annular race means and a plurality of rollers rotatably disposed therebetween with opposed portions of the circular perimeters thereof in frictional contact with the input and output annular race means, torque-equalizing means for equalizing the torque in the dual traction drive sections, said torque-equalizing means comprising first and second sets of support means for each of the pluralities of rollers of the dual traction drive sections, first and second support members secured at one end thereof to the first and second sets of support means, respectively, a balance lever pivotally mounted on the housing, and oppositely disposed pivot members formed on the balance lever and operatively connected to the other ends of the respective first and second support members for pivoting about the axis of the balance lever in response to any higher torque being transmitted by the pluralities of rollers of one of the dual traction drive sections as compared to the other of the dual traction drive sections as a result of the build-up of manufacturing tolerances within the respective dual sections, to thus permit the two pluralities of rollers to attain a torque balance as a result of comparable ratio changes occurring in each of the dual sections.

4,159,654

AUTOMATIC TRANSMISSION APPARATUS

Torao Hattori, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1977, Ser. No. 827,618
Claims priority, application, Japan, Sep. 2, 1976, 51/117036
Int. Cl.[2] F16H *3/08*
U.S. Cl. 74—331 **4 Claims**



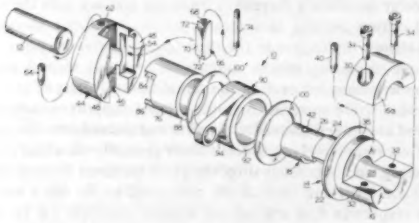
1. An automatic transmission comprising a casing, an input shaft outside of said casing, a first driving shaft inside of the casing and constituting an elongation of said input shaft and directly coupled thereto, an output shaft within the casing and parallel to said input shaft, a second driving shaft including first and second portions encircling said first driving shaft, a torque convertor coupling said input shaft to the first portion of said second driving shaft, a low-speed clutch coupled between said first and second portions whereby said second portion can be selectively driven by the input shaft through said torque convertor, a high-speed clutch and a high-speed transmission cooperatively and selectively coupling said first driving shaft to said output shaft for the selective driving of the latter, and gear means coupling the second portion of the second driving shaft to said output shaft.

4,159,655

ADJUSTABLE ECCENTRIC

Arthur R. Johnson, deceased, late of Hartford, Conn.; by Paul A. Hudon, administrator, and Martin Kesten, both of West Hartford, Conn., assignors to Preston Engravers, Inc., Windsor, Conn.

Filed Dec. 29, 1977, Ser. No. 865,716
Int. Cl.[2] G05G *1/12*
U.S. Cl. 74—571 L **17 Claims**



12. In an adjustable eccentric assembly, the combination comprising:

a. first collar means having a bore extending axially therethrough, a mounting portion adapted to mount said first collar means to a rotatable shaft member for rotation therewith about an axis of rotation, a first guide surface extending perpendicularly of the axis of rotation, and locking means adapted to lock said first collar means non-rotatably to the associated rotatable shaft member;

b. an arbor extending axially outwardly from said first guide surface of said first collar means and adapted to be seated upon the associated rotatable shaft member, and terminating in a collar seat;

c. second collar means having a bore extending axially therethrough and adapted to be seated upon the collar seat of said arbor, and mounting means adapted to non-rotatably mount said second collar means on said collar seat for rotation with said first collar means about the axis of rotation, said second collar means having a second guide surface extending parallel to and facing said first guide surface and being spaced apart therefrom along the common axis of rotation;

d. a hub member having a longitudinally extending cylindrical outer bearing surface and being non-rotatably supported between said first and second collar means for rotation therewith, said hub member having a longitudinal axis disposed parallel to the common axis of rotation and opposite ends extending perpendicularly of its longitudinal axis and slidably seated on, respectively, said first and second guide surfaces, and an axially extending interior passageway, both said bores and said interior passageway being axially aligned and adapted to receive the associated rotatable shaft member therethrough; and

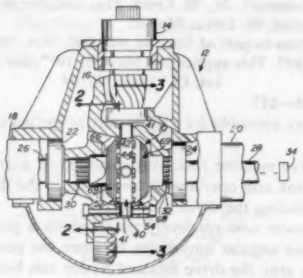
e. adjusting means operatively connected to said hub member and at least one of said collar means for radially moving said hub member along said guide surfaces to any one of selected positions relative to said collar means to displace the longitudinal axis of said hub member radially relative to the common axis of rotation of said collar means whereby to adjust the eccentricity of rotation of said hub member about the common axis of rotation, said hub member being guided by said guide surfaces to maintain the longitudinal axis of said hub member parallel to the common axis of rotation and said interior passageway of said hub member being sized and configured to provide clearance for such radial displacement of said hub member.

4,159,656

POSITIVE HOLD DIFFERENTIAL MECHANISM

Michael G. Tomich, 20519 Catalano Dr., Mt. Clemens, Mich. 48043

Continuation-in-part of Ser. No. 668,473, Mar. 19, 1976, Pat. No. 4,104,931. This application Nov. 10, 1977, Ser. No. 850,404
Int. Cl.[2] F16H *35/04*
U.S. Cl. 74—650 **6 Claims**



1. In a differential mechanism including an annular driving member, a pair of driven clutch members coaxially arranged at opposite ends of, and axially displaceable relative to, said driving member, respectively, the opposed faces of said driving and clutch members having interengaging clutch teeth, respectively, an annular center cam member arranged concentrically within, and connected for limited rotation relative to said driving member, the opposed faces of said center cam and

clutch members having interengaging cam teeth, respectively, and means biasing said driven clutch members axially inwardly toward said driving member, thereby to normally effect engagement between said clutch teeth on said driving and driven clutch members, respectively, and between said cam teeth on said driven clutch and center cam members, respectively, said cam teeth having profile configurations and heights to cause, when one driven clutch member overruns the driving member, axial displacement and corresponding disengagement of the clutch teeth of said one driven clutch member; the improvement which comprises

(a) means defining on one face of each pair of adjacent faces of said central cam and driven clutch members in equally spaced relation within the arrangement of cam teeth thereon a smaller number of indexing teeth, the width of each indexing tooth corresponding with the distance between the remote side surfaces of a given number of said cam teeth; and

(b) means defining on the other face of each pair of adjacent faces in corresponding equally spaced relation within the arrangement of cam teeth thereon a number of indexing spaces corresponding with the number of indexing teeth, the width of each indexing space being at least as great as the width of each indexing tooth, whereby when the said one clutch member overruns the driving member, said clutch member is normally disengaged and is axially indexed into driven engagement with said driving member only when the indexing teeth are opposite the indexing spaces, respectively.

5. A differential mechanism for compensating for the difference in driving wheel travel, said mechanism comprising:

a spider member having a plurality of arcuately spaced drive teeth on opposite sides thereof;

a pair of clutch members sandwiching said spider member thereinbetween, said clutch members each having a plurality of driven teeth releaseably engageable with said spider drive teeth for transmitting torque from said spider member to said clutches;

a plurality of arcuately spaced first cams carried by said spider member;

a plurality of arcuately spaced second cams carried by each of said clutch members and axially aligned with said spider member cams for lifting sand clutch member teeth out of engagement with said spider member teeth to permit relative movement between said spider member and on of said clutch members; and

a plurality of enlarged projections and mating enlarged slots carried between said spider member and clutch members for maintaining said relative movement between said spider member and one clutch member for an arcuate distance greater than the arcuate distance between adjacent spider member cams, said enlarged projections being of a one-piece construction with one of said members; wherein said projections are formed on said spider member in the form of a T-shape in a location adjacent the periphery of said spider, said slots being formed on said clutches adjacent the periphery thereof in axial alignment with said spider projections.

4,159,657

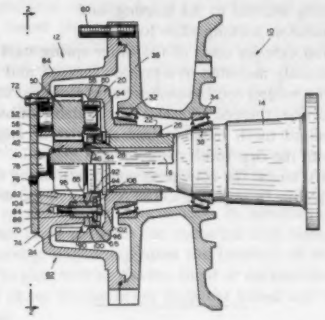
PLANETARY OUTER END

Herschel H. Stilley, Edwardsburg, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Mar. 6, 1978, Ser. No. 883,550
Int. Cl.[2] F16H *1/28, 57/00, 35/00;* **B60K** *17/34*
U.S. Cl. 74—801 **17 Claims**

1. In a drive axle of the type having an elongate axle housing, an axle drive shaft, a wheel structure rotatably mounted on said housing by bearing means, and a planetary outer end drivably connected with said axle drive shaft at one end of said housing for imparting rotation to said wheel structure, said planetary outer end having a plurality of members including a planet carrier assembly having a carrier housing and a carrier plate, wherein the improvement comprises in combination:

a. first means for locating and securing said carrier housing and carrier plate against angular movement relative to one another; and



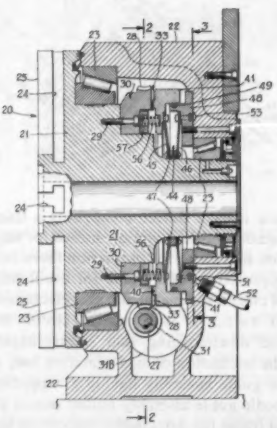
b. second means, concentric with said first means, for axially fastening and abuttingly securing said carrier housing and carrier plate against axial movement relative to one another whereby said first means is subject only to torsional shear loading and said second means is subjected only to axial tensile loading.

4,159,658

ROTARY INDEX TABLES

Edward J. Parkinson, Shelton, Conn., assignor to Bridgeport Machines Division of Textron Inc., Bridgeport, Conn.

Filed Apr. 4, 1977, Ser. No. 784,275
Int. Cl.[2] B23B *17/00;* **B23Q** *17/00*
U.S. Cl. 74—813 L **13 Claims**



1. A rotary worktable and indexing control unit comprising:

(A) a housing;

(B) a worktable rotatably secured to the housing;

(C) drive means for controllably rotating the worktable;

(D) a curvic coupling incorporating

(a) a first tooth member mounted for rotation with said worktable, and

(b) a second tooth member mounted to the housing and movable from a first disengaged position to a second locking position engaged with the first tooth member, preventing rotation of the worktable; and

(E) a bellows assembly, responsive to a pneumatic source for

controlled expansion and contraction thereof, and comprising

(a) two ring-shaped spring-steel members

(1) sealingly interconnected at their respective interior edges, with

(2) the exterior edge of one of said spring-steel members being secured to the housing; and

(b) a movable locking plate having

(1) the exterior edge of the other spring-steel member securely mounted to a portion thereof, and with

(2) the second tooth member being mounted to another portion thereof, thereby controllably moving said second tooth member into and out of engagement with the first tooth member, and

(F) control means for activating and deactivating the pneumatic source in response to the position of the worktable.

4,159,659

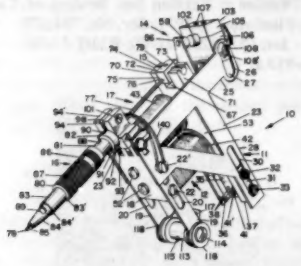
ELECTRICAL MARKING DEVICE

Carol Nightingale, Rte. #2, Box 159, Taneytown, Md. 21787

Filed May 16, 1978, Ser. No. 906,657

Int. Cl.[2] B41B *1/00*; A61B *17/20*

U.S. Cl. 81—9.22 **18 Claims**



1. An electric marker device comprising a frame, an armature bar, adjustable resilient support means for supporting said armature bar on said frame for oscillation thereon, electromagnet means supported on said frame for oscillating said armature, a control circuit for energizing said electromagnet means, an interrupter switch in said control circuit for cyclically energizing and de-energizing said electromagnet means in response to the oscillation of said armature bar, an elongated hollow needle guide assembly having a supported end and a free end, a needle guide assembly holder means pivotally supported on said frame for detachably supporting said supported end of said needle guide assembly in a predetermined position, a needle assembly comprising an elongated needle shaft and needle marker means affixed to one end of said shaft, said needle assembly being reciprocatably mounted in said hollow needle guide assembly with said needle marker means projecting from said free end and with said needle shaft projecting from said supported end, a needle assembly holder removably secured to the end of said needle shaft opposite said needle marker means, and bearing means on said armature bar for pivotally supporting said needle assembly holder and for reciprocating said needle assembly holder and needle assembly as said armature bar is oscillated by said electromagnet.

4,159,660

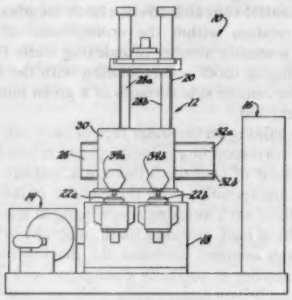
BIAXIAL TURNING MACHINE WITH MEANS FOR BIDIRECTIONAL INDEPENDENT TOOL COMPENSATION

James E. Buckley, Sterling Heights; Thomas E. McKendrick, Westland; Lee E. North, Farmington, and Nathan Mendelsohn, Southfield, all of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Feb. 21, 1978, Ser. No. 879,527

Int. Cl.[2] B23B *3/20, 3/30*

U.S. Cl. 82—3 **10 Claims**



1. A biaxial turning machine comprising:

support means,

first and second spindle means, mounted on the support means, for rotating respective first and second workpieces, the first and second spindle means having parallel axes of rotation;

compound slide member means, mounted on the support means in sliding relation thereto, for motion in a first direction with respect to the spindle means axes;

cross slide member means mounted on the compound slide member means in sliding relation thereto, for motion in a second direction transverse to the first direction;

first tool holder member means mounted on the cross slide member means in sliding relation thereto, for holding a workpiece machining tool and for motion parallel to the first direction;

second tool holder member means, mounted on the cross slide member means in sliding relation thereto, for holding another workpiece machining tool, and for motion parallel to the second direction;

a plurality of axis drive means, one each of the axis drive means associated with each of the member means, for moving each of the associated member means;

a plurality of sensor means, one each of the sensor means associated with each of the axis drive means, for sensing motion of each of the member means and outputting a signal representative thereof; and

control means, responsive to a position command signal for a specific member means and to the output signal of the sensor means associated with the specific member means, for controlling the axis drive means to position the specific member means in accordance with the command signal.

4,159,661

ROTARY CUTTER

Alfred G. Russell, Lebannon, and Michael W. Schwetz, Warren, both of N.J., assignors to Egan Machinery Company, Somerville, N.J.

Filed Jul. 5, 1977, Ser. No. 812,658

Int. Cl.[2] B26D *1/38, 1/56*

U.S. Cl. 83—305 **10 Claims**

1. A rotary cutter comprising:

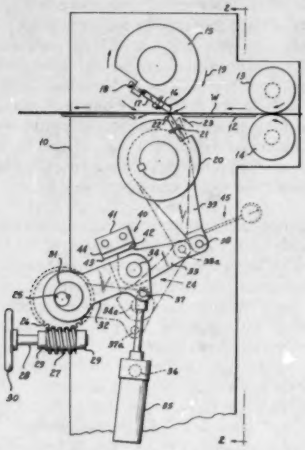
a frame;

a rotary knife rotatably mounted to said frame;

a bed knife;

means displacably mounting said bed knife in said frame to travel in a path between an operative position adjacent said rotary knife in an inoperative position remote from said rotary knife;

extendable linkage means connected with said bed knife to define said operative position of said bed knife when said linkage means is disposed in fully extended position and



said extendable linkage to contract during travel of said bed knife from said operative position;

actuating means connected to said extendable linkage intermediate the ends thereof to cause said bed knife to travel in said path between said operative and inoperative positions; and

means to adjust said extendable linkage means to said fully extended position to thereby adjust the operative position of said bed knife.

4,159,662

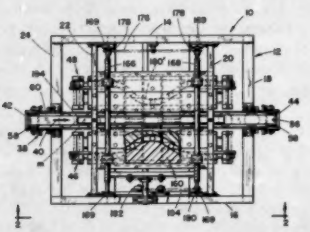
MUFFIN SPLITTER

John A. Weaver, York, Pa., assignor to Alto Corporation, York, Pa.

Continuation of Ser. No. 847,662, Nov. 1, 1977, abandoned. This application Nov. 8, 1978, Ser. No. 958,797

Int. Cl.[2] B26D *3/28, 4/76*

U.S. Cl. 83—867 **34 Claims**



1. A muffin splitter comprising a frame; a muffing conveying assembly on the frame including a conveyor for moving muffins from an infeed end to a discharge end; a pair of muffin tine assemblies on the frame located to either side of the muffin conveyor assembly, each muffin tine assembly including a plurality of elongate muffin-piercing tines, first means supporting the tines, second means for moving the first means and tines downstream along the muffin conveyor assembly at the same speed and in the same direction as the conveyor moves muffins along the conveyor, a first cam mounted on the frame between the conveyor and the normal path of movement of the first means along the muffin conveying assembly, a second cam movable on the frame between a retracted position located outwardly of the normal path of movement of the first means along the muffin conveying assembly and an extended position adjacent said first cam and in the path of normal movement of said first means along the muffin conveying assembly, said cams having smooth cam surfaces such that when the second cam is extended the second means moves the first means into engagement with said second cam to extend the tines into muffins on the conveyor path and to retract the tines from the muffins; and a cam moving device on the frame extending transversely past the cams and the muffin conveying assembly, drive connections between said device and each of said second cams of said pair of muffin tine assemblies operable, upon actuation of the cam moving device, to simultaneously shift said second cams between the retracted and extended positions, whereby, depending upon the location of said second cams by the cam moving device, tined or untined muffins may be moved along the conveyor from the infeed end to the discharge end.

4,159,663

ELECTRONIC MUSICAL INSTRUMENT WITH DIFFERENT TYPES OF TONE FORMING SYSTEMS

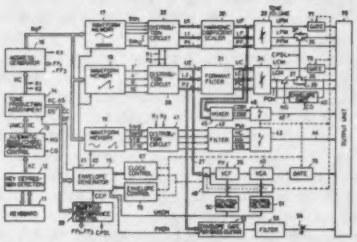
Eiichiro Aoki, and Tsutomu Suzuki, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 26, 1977, Ser. No. 845,593

Claims priority, application Japan, Oct. 28, 1976, 51/129825

Int. Cl.[2] G10H *1/02*

U.S. Cl. 84—1.24 **12 Claims**



1. An electronic musical instrument having keys and a plurality of musical tone forming systems capable of concurrently producing tones of different tonal quality for notes designated by selection of the same subset of keys, the outputs of all of said tone forming systems being connected to a common output unit, said instrument also having selection means for facilitating selection by a performer of which tone forming systems shall be employed for one production, which instrument comprises:

priority means, cooperating with said selection means, for establishing a priority order among said musical tone forming systems to employ for musical tone production that one tone forming system having a highest priority out of one or plural systems selected by a performer from said plurality of musical tone forming systems; and

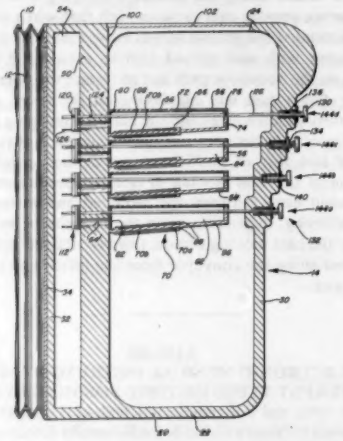
ensemble selection means, cooperating with said selection means and with said priority means and operative upon selection of ensemble production by said performer, for enabling predetermined plural systems among said musical tone forming systems to be employed concurrently for musical tone production instead of musical tone production by one system according to said priority order.

4,159,664

KEYBOARD ASSEMBLY FOR AN ACCORDION

Enrico M. Mastronardi, P.O. Box 267, Rte. 1, Chillicothe, Ill. 61523

Filed Feb. 3, 1978, Ser. No. 874,793
Int. Cl.[2] G10D 11/00, 11/02
U.S. Cl. 84—376 R 16 Claims



1. In an accordion having a bellows defining a flexible air chamber and an end box at each end of said air chamber, the improvement comprising:

a casing defining each of said end boxes including a back wall adapted to be placed adjacent the body of the accordionist, a front wall, and a side wall connected between said back and front walls extending away from the accordionist;

a plurality of means in each end box each producing a single tone when air is delivered thereto from said bellows, each tone producing means being selected to generate one note of the chromatic scale and together generating a consecutive series of notes corresponding to each half step of the chromatic scale along a selected interval, each tone produced by one of said tone producing means in one end box being dissimilar to the tones produced by each of the other tone producing means in said one end box; and

a corresponding number of keys one associated with each of said tone producing means and having means for operating its respective tone producing means by controlling delivery of air thereto from said bellows, said keys being located on the exterior of said side walls of said casing, extending and actuated in a direction generally parallel to said back and front walls and arranged in longitudinal and transverse rows for manual manipulation by an accordionist, the physical arrangement of the keys on one end casing being the mirror image of that on the other end casing and corresponding keys on each end casing operating tone producing means for notes having the same note names, the interval between notes generated by the tone producing means operated by adjacent keys in the longitudinal rows being in major thirds and the interval between notes generated by the tone producing means operated by adjacent keys in the transverse rows being in minor seconds.

7. In a musical instrument including a bellows defining a flexible air chamber and an end box at each end of said air chamber, each end box comprising:

a casing secured to said bellows;

a reed block plate mounted between said casing and said bellows to define an internal chamber within said casing, said casing having an opening to provide communication between said internal chamber and the exterior thereof;

enclosure means for defining a tone chamber within said internal chamber including walls spaced from said casing with an opening therein to permit air to pass from said tone chamber into the space between said casing and said walls;

a plurality of reed blocks within said tone chamber each being mounted to said reed block plate, each reed block defining at least one cell including passage means at one end of each cell providing communication between said flexible air chamber and its respective cell;

a plurality of reeds mounted on said reed blocks with at least one overlying each cell to at least partially define the cell such that air moved through the cell flows past the respective reed to effect vibration thereof to generate a tone, each reed selected to generate one note of the chromatic scale and together generating a consecutive series of notes corresponding to each half step of the chromatic scale along a selected interval, the tone generated by each reed being dissimilar to the tones generated by any of the other reeds;

a keyboard on said casing including an external key associated with each passage and adapted to be manually depressed by an accordionist, said keys being arranged on the exterior of said casing in longitudinal and transverse rows, the interval between notes generated by the reeds associated with adjacent keys in the longitudinal rows being in major thirds and the interval between notes generated by the reeds associated with adjacent keys in the transverse rows being in minor seconds;

a plurality of valve rods one secured to each key at one end thereof and extending through said internal chamber and said reed block plate to move axially inward as its associated key is depressed;

a plurality of valve members one secured to the other end of each valve rod, a valve member being disposed at said one end of each cell and being adapted to be moved axially outward toward a closed position over said one end to prevent air from moving between said flexible air chamber and said cell and axially inward toward an open position spaced from said one end to permit air to move between said flexible air chamber and said cell and flow past the respective reed; and

biasing means for urging each of said valve members axially outward to said closed position over their respective open ends.

10. In a musical instrument including a bellows defining a flexible air chamber and an end box at each end of said air chamber, each end box comprising:

a casing secured to said bellows;

a reed block plate mounted between said casing and said bellows to define an internal chamber within said casing, said casing having an opening to provide communication between said internal chamber and the exterior thereof;

enclosure means for defining a tone chamber within said internal chamber including walls spaced from said casing with an opening therein to permit air to pass from said tone chamber into the space between said casing and said walls;

a plurality of reed blocks within said tone chamber each being mounted to said reed block plate, each reed block defining at least one cell and passage means at one end of each cell providing communication between said flexible air chamber and its respective cell;

a plurality of reeds mounted on said reed blocks with at least one overlying each cell to at least partially define the cell such that air moved through the cell flows past the respective reed to effect vibration thereof to generate a tone, the tone generated by each reed being dissimilar to the tones generated by any of the other reeds within the end box;

a keyboard on said casing including an external key associated with each cell and adapted to be manually depressed by an accordionist;

a plurality of valve rods one secured to each key at one end thereof and extending through said internal chamber and

said reed block plate to move axially inward as its associated key is depressed;

a plurality of valve members one secured to the other end of each valve rod, a valve member being disposed at said one end of each cell and being adapted to be moved axially outward toward a closed position over said one end to prevent air from moving between said flexible air chamber and said cell and axially inward toward an open position spaced from said one end to permit air to move between said flexible air chamber and said cell and flow past the respective reed; and

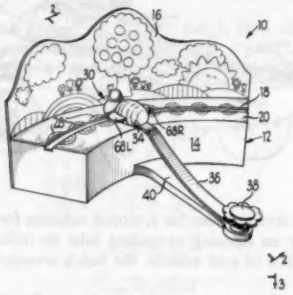
biasing means for urging each of said valve members axially outward to said closed position over their respective open ends.

4,159,665

MUSICAL TOY

Rouben T. Terzian, Chicago, and Burton C. Meyer, Downers Grove, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 26, 1978, Ser. No. 872,427
Int. Cl.[2] G10D *13/08*
U.S. Cl. 84—404 **8 Claims**



1. A musical toy, comprising:

a housing;

a plurality of tone bars mounted within the housing for producing a musical note upon being struck;

means for striking a selected tone bar to produce an audible signal, said striking means comprising a movable housing, drive means and a rotatable striker element connected thereto rotatably mounted within the movable housing;

means for energizing said drive means;

selectively operable switch means on said movable housing for selectively connecting said drive means to said energizing means; and

means for guiding said striking means along a path of travel adjacent each of said tone bars, said guide means comprises an elongated portion of the housing having a pivot axis defined on the end thereof and a resilient connecting arm pivotally secured to said pivot axis at one end and secured to said movable housing on the other.

4,159,666

EXPANDING HEAD RIVETING METHOD AND SYSTEM

Franklin S. Briles, 1301 Dolphin, Corona del Mar, Calif. 92625

Division of Ser. No. 732,869, Oct. 15, 1976, Pat. No. 4,051,592, which is a continuation-in-part of Ser. No. 645,242, Dec. 29, 1975, Pat. No. 4,000,680. This application Apr. 28, 1977, Ser. No. 791,715
The portion of the term of this patent subsequent to May 2, 1995, has been disclaimed.
Int. Cl.[2] F16B *19/04*
U.S. Cl. 85—37 **11 Claims**

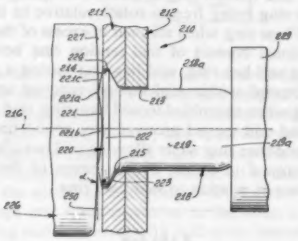
1. In combination with a workpiece having a bore, a first counterbore which is substantially cylindrical, and a second counterbore which is frusto-conical and tapers forwardly between the first counterbore and the bore and toward the bore,

(a) a rivet having an axially extending shank received in the workpiece and defining an axis,

(b) the rivet including a head having an end face, a first section located forwardly of said end face, and a second and forwardly tapered frusto-conical section located forwardly of the first section,

(c) the first section having an initial undeformed outer surface of a diameter which is less than but about the same as the initial diameter of the first counterbore, the rivet first section being radially deformed to have peripheral engagement with the first counterbore,

(d) said head end face being substantially flush with the work surface,



(e) said head end face initially defining an undeformed ring-shaped dome extending about said axis and in substantial axial alignment with the outer surface of the shank,

(f) the dome having an annular crest portion in axial alignment with said shank outer surface, and the dome radially outer extent which defines only about half of the dome being located in axially spaced relation to a forward taper defined by said second and forwardly tapered section, said dome crest portion being rearwardly convex in axial radial planes,

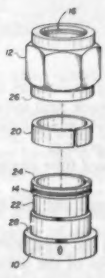
(g) the head end face forming a concave central recess radially inwardly of said crest portion, the outermost annular extent of said recess located approximately in alignment with the outer surface of the shank.

4,159,667

TORQUE LIMITING RF CONNECTOR

Donald B. Nordstrom, Stuart, Fla., assignor to Solitron Devices, Inc., Tappan, N.Y.

Filed Aug. 8, 1977, Ser. No. 822,602
Int. Cl.[2] F16B *31/02*
U.S. Cl. 85—61 **2 Claims**



1. A coupling nut comprising:

a base ring that is adapted to receive a member to be coupled by the nut, said base ring having internal threads at one end for the coupling of the nut, a shoulder at the one end

and an elongated body above said shoulder, said elongated body having first and second grooved areas in said body;

a tension ring rotatably supported within said first grooved area in said base ring, said tension ring having a cross sectional thickness such that it presents an external diameter from within said first grooved area greater than the external diameter of said elongated body but less than the external diameter of said shoulder; and

a hex ring having an internal bore that permits it to be assembled about said tension ring to said base ring, said bore of a diameter that on assembly is less than the external diameter of the tension ring to compress said tension ring between the hex ring and the base ring providing a frictional connection of said base ring and said hex ring, said frictional connection being torque limiting whereby said hex ring may be wrenched to bidirectionally drive said base ring via said tension ring to effect a coupling of the nut, said hex ring being free to rotate relative to the tension ring and base ring when torqued in excess of the forces of the frictional contact of said tension ring between said base ring and hex ring, said hex ring having a projecting flange located within said second grooved area of said base ring when assembled to said base ring, said projecting flange and said second grooved area connecting said hex ring to said base ring while allowing said hex ring to rotate when torqued in excess of the forces of the frictional connection in relation to said base ring.

4,159,668

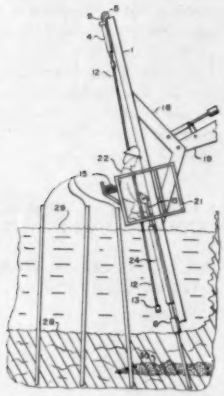
METHOD FOR PLACING EXPLOSIVES IN SUBMERGED ROCK

Roy N. Sonomura, P.O. Box 1452, Hilo, Hi. 96720

Division of Ser. No. 688,551, May 17, 1976, Pat. No. 4,102,412. This application Jul. 20, 1977, Ser. No. 817,245

Int. Cl.[2] E21B 7/12

U.S. Cl. 86—20 C **2 Claims**



1. A method of placing explosives in holes drilled in submerged rock by use of a rock drill mounted for reciprocation along a strut having a debris guard tube extending beyond the terminus of the strut comprising:

a. forcing the debris guard tube against the rock at the point to be drilled;

b. extending the drill head into the rock through the debris guard tube;

c. drilling and cleaning the hole with the drill;

d. retracting the drill out of the debris guard tube;

e. deflecting the drill rod to one side of the debris guard;

f. inserting an explosives placement tube into the hole through the debris guard tube;

g. raising the strut until the debris guard tube is completely free of the explosives placement tube whereby the drill operator can move to another location for drilling the next hole without waiting for completion of the explosives placement;

h. inserting the explosives and detonator into the hole through the explosives placement tube; and

i. stuffing packing into the tube; whereby the explosives placement tube being inserted into the hole through the debris guard tube keeps the hole clean and clear of debris after the drilling apparatus is removed thereby insuring placement of the explosives at the required point and allowing separation of drilling and explosives placement operations.

4,159,669

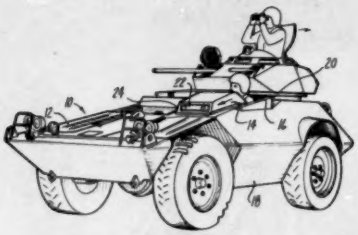
HATCH FOR ARMORED VEHICLES

Theodore A. Jackson, Utica, and James D. Crabtree, St. Clair Shores, both of Mich., assignors to Cadillac Gage Company, Warren, Mich.

Filed Oct. 14, 1977, Ser. No. 842,215

Int. Cl.[2] B60J 7/00

U.S. Cl. 89—36 L **17 Claims**



1. A hatch arrangement for armored vehicles for providing a closure for an opening extending into an oblique frontal armored surface of said vehicle, the hatch arrangement comprising:

a hatch configured to provide a closure for said vehicle opening;

means providing for guided movement of said hatch between an open and closed position with respect to said opening, said means including guide means guiding said hatch for movement away from said opening in a frontal direction along said sloping surface down from said opening whereby said hatch is positioned in said open position at an oblique angle corresponding to said oblique frontal surface of said armored vehicle.

4,159,670

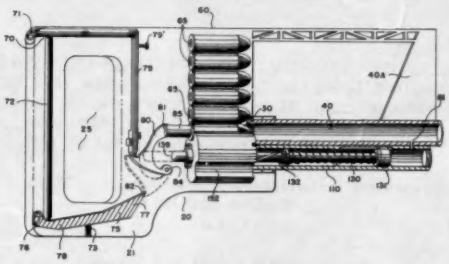
HANDGUN

Laurence E. Turner, 6 Woodward Ave., Norwalk, Conn. 06854

Filed Jun. 3, 1977, Ser. No. 803,140

Int. Cl.[2] F41D 7/04

U.S. Cl. 89—155 **25 Claims**



1. A handgun, comprising:

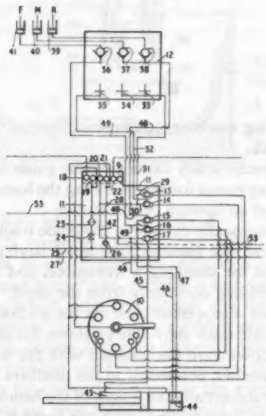
a housing including a grip portion having an aperture therein to receive the fingers of a hand and a frontal breech-enclosing portion disposed forwardly of said grip portion;
a breech mounted in said frontal housing portion;
a barrel mounted forwardly of said breech, said breech and barrel being aligned with the approximate vertical center of the aperture of said gripping portion;
a magazine for receiving a stack of horizontally oriented cartridges disposed above said frontal housing portion and communicating with said breech;
a sight mounted in raised relation to said barrel and aligned with the top of said magazine and the top of said gripping portion;
a hammer mounted behind said breech; and
a thumb-actuated trigger assembly including a thumb trigger mounted above and behind said aperture and a trigger linkage adapted to mechanically actuate said hammer upon depression of said thumb trigger.

4,159,671

SELF-ADVANCING MINE ROOF SUPPORTS

Archelaius D. Allen, 6 Brookdale Close, Leyland, Preston, England

Continuation of Ser. No. 592,997, Jul. 3, 1975, abandoned. This application Dec. 2, 1977, Ser. No. 857,016
Claims priority, application United Kingdom, Aug. 20, 1974, 36490/74
Int. Cl.[2] F15B *13/04, 11/00*
U.S. Cl. 91—32 **7 Claims**



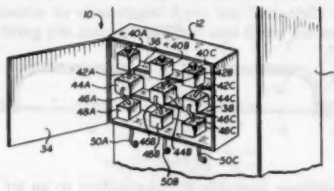
1. A self-advancing mine roof support system which comprises a plurality of mine roof supports arranged side-by-side and means for passing an automatic sequencing control signal between adjacent supports; each of said supports including manually operable control valve means, an automatic sequence control valve means operable in response to said control signal passed thereto, each of said manually operable and automatic sequence control valve means providing for controlling the operations of the support, isolating valve means arranged so that either one of said manually operable control valve means and said automatic sequence control valve means can effect operation of said support independently of the other, and a manually operable signal generator means operable independently of either of said control valve means and arranged to apply an output signal to the automatic sequence control valve means of a next adjacent support to permit selective control of that next adjacent support through an automatic advance sequence thereof.

4,159,672

SCENT PRODUCING APPARATUS FOR FORCED AIR SYSTEM

Michael Garguilo, 1812 Westminster Blvd., and Ronald DeVito, 1106 Westminster Blvd., both of Parlin, N.J. 08859

Filed Oct. 31, 1977, Ser. No. 846,714
Int. Cl.[2] F24F *7/06*
U.S. Cl. 98—30 **12 Claims**



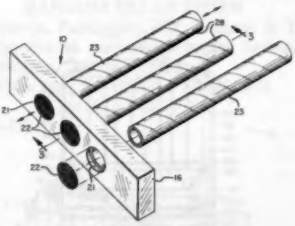
1. Apparatus for automatically and controllably introducing a scent on demand into a forced air temperature changing system of the type having a blower, and an air filter positioned in the air path of said blower; said apparatus comprising:
a container for retaining a fluid having the desired scent; spray means adapted to be connected to said system adjacent the air filter and positioned to direct fluid exiting through said spray means on to the filter; a conduit connecting said container with said spray means to provide a passage for the flow of fluid from said container to said spray means; and manually operable control means serially connected in said conduit between said container and said spray means for controlling the amount and timing of the flow of fluid to said spray means whereby the presence and the apparent strength of the scent added to the air is controllable at will, by the operator.

4,159,673

VENT BLOCK

James F. Weirich, 200 Posada Del Sol #40, Novato, Calif. 94947

Filed Nov. 14, 1977, Ser. No. 851,394
Int. Cl.[2] F24F *7/00*
U.S. Cl. 98—37 **15 Claims**



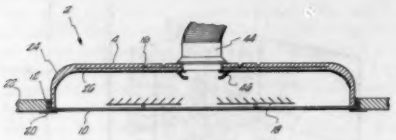
1. A vent block for attic ventilation in a building, comprising:
an elongate wooden member adapted to fit beneath the roof line of the building, between adjacent rafters;
said wooden member having at least one circular bore therethrough, positioned to establish ventilating communication between the attic and the exterior of the building;
a circular patch of screen pressed into each such circular bore, the screen being of slightly larger original diameter than the portion of the bore into which it is pressed, so that it bows inwardly and is locked into the bore; and
an air conduit tube extending axially from each bore, so that when the vent block is installed with the tube inclined upwardly into the attic, the tube is positioned to pass through attic floor insulation, thereby to prevent vent blockage by the insulation.

4,159,674

UNIVERSAL DIFFUSER ASSEMBLY AND METHOD OF MANUFACTURING

Edward C. Brumleu, Jr., 18612 Marapose Dr., Villa Park, Calif. 92667

Filed Apr. 26, 1977, Ser. No. 791,064
Int. Cl.[2] F24F 7/00; B32B 5/14
U.S. Cl. 98—40 R 25 Claims



1. In a diffuser assembly for connection to an air delivery system the improvement comprising;

a plenum chamber having a base connector member and an outwardly extending wall defining an approximately concave configuration, the wall and connector member formed from molded glass fibers and plastic binders to provide a cross-sectional configuration having an interior fibrous textured surface and a comparatively more densely fibrous packed exterior housing surface to provide a lightweight sound absorbing diffuser assembly, the total density of the base connector member being less than the total density of the wall whereby the wall is provided with greater structural strength while the base connector member has greater insulation and sound absorbing capabilities, and

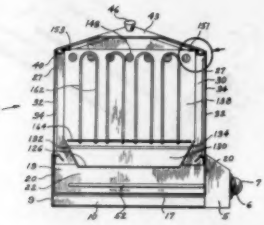
means for connecting the plenum chamber to the air delivery system.

4,159,675

WIENER HEATING UNIT

John F. Schwarz, and Ralph J. Tinkham, both of St. Louis, Mo., assignors to Peabody International Corporation, Stamford, Conn.

Filed Jan. 25, 1978, Ser. No. 872,043
Int. Cl.[2] A47J 27/00
U.S. Cl. 99—444 15 Claims



15. In a wiener steam heating device having a steam heating source, a wiener support assembly comprising:

(a) a pan assembly having a catch tray positioned above the steam heating source;

(b) the pan assembly having a pair of walls extending above the catch tray;

(c) a wiener support grill in the pan assembly within the walls and means to support the grill at least partially above the tray with a location space for wieners formed between the walls and above the lower edge of the walls, the walls being solid from their lower edges to above the wiener cooking space; and

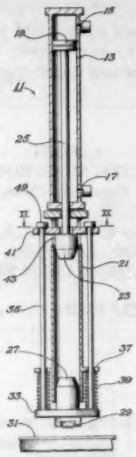
(d) the walls having an opening at the upper ends of the walls above the wiener location space for allowing steam from the steam heating source to pass from the outside of the walls to the inside of the walls to steam heat the wieners at the top of the wiener location space.

4,159,676

STAMPING MACHINE

Darrell L. Joyce, and Richard E. Kessler, both of Houston, Tex., assignors to Gachman Steel Company, Fort Worth, Tex.

Filed Oct. 31, 1977, Ser. No. 847,247
Int. Cl.[2] B44B 5/00
U.S. Cl. 101—3 R 8 Claims



1. A stamping machine, comprising:

a guide track;

a hammer reciprocally carried by the guide track;

reciprocating means for reciprocating the hammer in a down stroke and an upward return stroke;

an anvil reciprocally carried by the guide track for receiving blows from the hammer, the anvil having a die on its lower end for stamping a workpiece, and having a platform extending outwardly from the anvil;

spring means compressed between the platform and a point on the guide track above the platform, for urging the anvil and die downward into contact with the workpiece;

a linking member, connected to the platform and extending upward substantially the length of the hammer stroke; and

lifting means, cooperating with the hammer, for engaging and lifting the linking member on the return stroke thereby lifting the die a selected distance from the workpiece and compressing the spring.

4,159,677

EMBOSSER

Franklin G. Smith, 2944 SE. Tibbetts, Portland, Oreg. 97202, assignor to Franklin G. Smith, Portland, Oreg.

Filed Apr. 25, 1977, Ser. No. 790,478
Int. Cl.[2] B44B 5/00
U.S. Cl. 101—23 3 Claims

1. In an embosser,

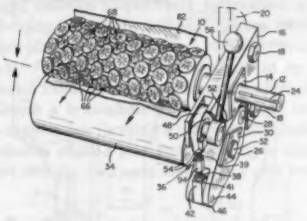
a resilient backing member,

a cylindrical roll paralleling the member,

a plurality of embossing segments having arcuate inner

surfaces and raised embossing portions on the outer surfaces,

and an adhesive fastening the segments to the roll,



the roll having a screw thread swaged crosswise in at least portions thereof to form overhangs.

4,159,678

PROPELLANT CHARGE CASING

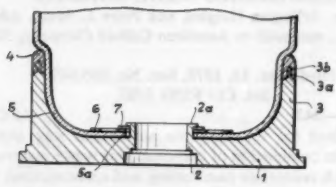
Hans-Werner Luther, Kaarst, and Peter Bender, Dusseldorf, both of Fed. Rep. of Germany, assignors to Rheinmetall G.m.b.H., Dusseldorf, Fed. Rep. of Germany

Filed Sep. 15, 1977, Ser. No. 833,713

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 26416659

Int. Cl.[2] F42B *5/26*

U.S. Cl. 102—44 **5 Claims**



1. A casing for a propellant comprising:

a cylindrically symmetric base having a muzzle end and a primer end, in which said base includes a rim extending out from said primer end, forming a cup and ending in a lip, and in which base, said primer end includes axially centered means for connecting a primer cap,

a combustible charge container disposed within said cup formed by said rim, and having an aperture through which said means for connecting a primer cap extends,

a resilient bearing plate member disposed about said means for connecting a primer cap and within said combustible container, said resilient bearing plate is formed from spring steel, has a plurality of apertures extending therethrough and has a plurality of radial slits extending inward from a periphery, and

fastening means for attaching said resilient bearing plate to said means for connecting a primer cap, whereby said combustible propellant case is confined within said base.

4,159,679

PROJECTILE FUZE

Melvin Eneman, New York, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

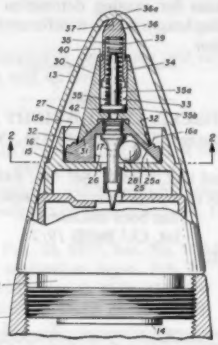
Continuation-in-part of Ser. No. 703,711, Jul. 9, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,684

Int. Cl.[2] F42C *15/22, 1/00*

U.S. Cl. 102—237 **5 Claims**

1. In a point detonating spin stabilized projectile having a tapered forward nose member and a fuze forward housing secured in said nose member,

said fuze forward housing having a central longitudinal passage accommodating a longitudinally movable firing pin, said fuze forward housing having a forwardly opening recess containing a firing pin assembly, said firing pin assembly including said firing pin and an element having a plurality of slotted inclined walls, a camming ball adjacent each of said slotted inclined walls, each of said balls being responsive to centrifugal force for forwardly camming said firing pin assembly to arm said firing pin assembly,



a graze sensor having means for rearwardly camming said armed firing pin assembly to operatively actuate said firing pin, said graze sensor having a forwardly opening cylindrical recess,

said firing pin assembly element having means including an annular forwardly protruding beveled surface for limiting lateral movements of said graze sensor,

a rearwardly opening tubular sleeve slidably mounted in said cylindrical recess, and

a compression spring in said sleeve for forwardly biasing said sleeve against said nose member.

4,159,680

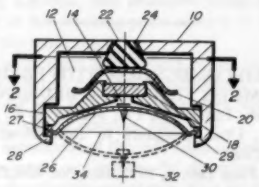
RANDOM DELAY TIMER

Alexey T. Zacharin, Parsippany, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 1, 1978, Ser. No. 901,876

Int. Cl.[2] F42C *9/06*

U.S. Cl. 102—277 **5 Claims**



1. A fuze for a munition, comprising:

an airtight enclosed housing,

an internal partition secured within said housing and defining a primary chamber and a secondary chamber on either side of said partition,

an external pressure port in said housing communicating with said primary chamber,

diaphragm means mounted in said housing for isolating said secondary chamber from external pressure outside said housing and said secondary chamber, said diaphragm

means being dependable between a static condition and a pressurized condition,

means in said partition for metering gaseous flow from said primary to said secondary chamber,

movable seal means operatively related to said external pressure port for releasably communicating said primary chamber to external pressure outside said housing and sealing said port against said pressure,

resilient biasing force means bearing against said movable seal means for biasing said movable seal means toward sealing relationship with said external pressure port, and

detonation means operatively connected with said diaphragm means for causing detonation of said munition when said diaphragm means is deformed into said pressurized condition.

4,159,681

REINFORCED, LIGHT-WEIGHT PALLET

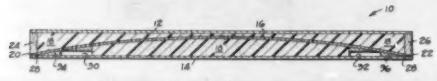
Daniel D. Vandament, 527 Fairview Ave., Mill Valley, Calif. 94941

Filed Oct. 3, 1977, Ser. No. 838,728

The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.

Int. Cl.[2] B65D *19/26*

U.S. Cl. 108—51.1 **10 Claims**



1. A light-weight, load carrying pallet, adapted for use with a fork lift or the like, comprising

a reinforced pallet structure having an upper sheet member and a lower sheet member with a flexible member arranged in the form of an arch there between and secured at its ends to the lower sheet member, adhesive foam material intimately contacting both sides of the flexible arched member and the inner surfaces of the sheet members to completely fill the spaces between the flexible arched member and the sheet members and to effectively rigidize and maintain the arched member in its arched configuration, and

recess forming means arranged in longitudinally spaced apart relation adjacent the lower sheet member to receive elongated load carrying tines of a fork lift, the spaced apart recess forming means being structurally interconnected with the ends of the arched member in order to transfer the weight of a load carried upon the upper sheet to the load carrying tines substantially through the arched member.

4,159,682

FLUID BED COMBUSTION WITH PREDRYING OF MOIST FEED USING BED SAND

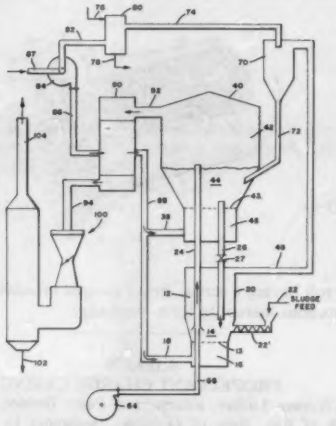
Elliot B. Fitch, Pittsburgh, Pa., and Orris E. Albertson, Salt Lake City, Utah, assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Dec. 1, 1977, Ser. No. 856,379

Int. Cl.[2] F23G *5/04*

U.S. Cl. 110—245 **33 Claims**

1. A process for combustion of moist combustible feed wherein said moist feed is first dried and then introduced into a fluidized bed of hot, inert, particulate material for combustion comprising, withdrawing a quantity of said hot particulate material from said fluidized bed, intimately contacting said moist feed with said hot particulate bed material to evaporate the water in the feed at a relatively low temperature, separating the dried solids from the gas stream containing the evaporated water, charging the separated dried feed and the particulate bed material associated therewith into said fluidized bed for combustion, treating the separated gas stream to remove and dispose of the water vapor therein and forwarding the



balance of the separated gas stream for further use in the process.

4,159,683

METHOD FOR REDUCING THE FORMATION OF SLAG AND SOOT FORMED FROM THE COMBUSTION OF CARBONACEOUS WASTE MATERIAL

John Hughes, Arlington Heights, and Peter L. Maul, Addison, both of Ill., assignors to American Colloid Company, Skokie, Ill.

Filed Mar. 13, 1978, Ser. No. 885,660

Int. Cl.[2] F23G *7/00*

U.S. Cl. 110—343 **11 Claims**

1. A method for reducing the amount of slag and soot formed by the combustion of carbonaceous waste material in a furnace which comprises combusting said carbonaceous waste material in said furnace in the presence of at least 0.0001%, by weight, of sodium bentonite based on the weight of said carbonaceous waste material.

4,159,684

METHOD FOR INCINERATING WASTE SLUDGES

William M. Kirkup, Blunham, England, assignor to Esmil-Envirotech, Ltd., Huntingdon, England

Filed Nov. 23, 1976, Ser. No. 744,413

Int. Cl.[2] F23G *5/00*

U.S. Cl. 110—346 **8 Claims**

1. A method of incinerating a sewage sludge comprising incinerating a sludge, in dewatered but wet condition, when mixed with wet coal fines as a supplementary fuel recovered from a wet benification process for coal, in the form of one of a coal filter cake and ex-lagoon sludge.

4,159,685

FORMATION OF VARIABLE WIDTH CUTTING SPACE BUTTONHOLE PATTERNS IN AN ELECTRONICALLY CONTROLLED SEWING MACHINE

John W. Wurst, Dover, and William H. Dunn, Branchville, both of N.J., assignors to The Singer Company, New York, N.Y.

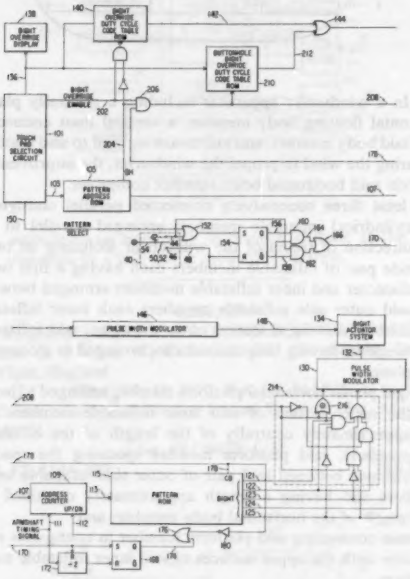
Filed Jul. 28, 1978, Ser. No. 928,938

Int. Cl.[2] D05B *3/06, 3/02*

U.S. Cl. 112—158 B **2 Claims**

1. In a sewing machine having stitch forming instrumentalities positionally controlled over a predetermined range between stitches to produce a pattern of feed and bight controlled stitches, static memory means for storing pattern stitch

information, means operating in timed relation with said sewing machine for recovering selected pattern stitch information from said static memory means, separate actuating means responsive to said pattern stitch information for influencing the feed and bight motions respectively to produce a pattern of stitches corresponding to the selected pattern stitch information and controllable bight alteration means effective to alter the operation of said bight actuating means to an amount of motion different from that dictated by said pattern stitch information, wherein a buttonhole pattern includes two parallel rows of zig-zag stitches forming a pair of buttonhole side bars, the inner stitches of said side bars defining a cutting space therebetween and the outer stitches of said side bars defining



the width of said buttonhole pattern, the improvement comprising means for selectively varying the width of the cutting space while maintaining constant the overall buttonhole pattern width including:

override memory means for storing bight actuating means motion alteration values in addressable memory locations;

operator controlled means for providing an address signal corresponding to a desired alteration value;

means utilizing said address signal for retrieving from said override memory means said desired alteration value; and

converting means operative only during the inner stitches of said side bars for converting said desired alteration value into a control signal for rendering effective said bight alteration means.

4,159,686

PROCESS FOR SMOOTHING THE EYE OF A NEEDLE AND NEEDLE MADE THEREBY

Helmut Heim, Membach, Belgium, assignor to Manufacture Belge d'Aiguilles S.A., Eupen, Belgium

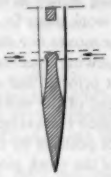
Filed Nov. 23, 1976, Ser. No. 744,313

Claims priority, application United Kingdom, Dec. 1, 1975, 49291/75

Int. Cl.[2] D05B *85/00*

U.S. Cl. 112—222 **38 Claims**

1. A process for smoothing the eye of a needle including the step of subjecting an area of the needle eye to one or more pulses of high power density radiation to melt the surface of



said area, and subsequently permitting said surface to solidify thereby to smooth said surface.

4,159,687

AUTOMATIC GUIDING METHOD FOR WORKPIECE IN SEWING MACHINE

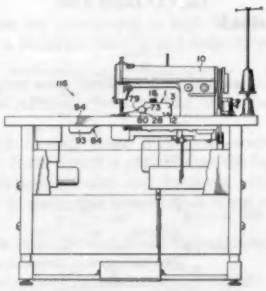
Koji Masuda, Sagamihara, and Nobuyoshi Haniuda, Yokohama, both of Japan, assignors to Kayabe Industry Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1977, Ser. No. 772,340

Claims priority, application Japan, Feb. 27, 1976, 51-20924; Apr. 5, 1976, 51-37904; Apr. 5, 1976, 51-37905

Int. Cl.[2] D05B *21/00, 35/10*

U.S. Cl. 112—262.3 **3 Claims**



1. A method of automatically guiding a work piece in a sewing machine, comprising the steps of:

detecting the deviation of the position of the side edge of a work piece from a control position only when the side edge moves in a direction toward the line of stitching in the sewing machine, said detection being effected at a point prior to the stitching point relative to the direction of feed of the work piece;

moving said work piece transversely of the stitch line back toward the control position in response to the detected deviation until said side edge of the work piece is brought back to said control position; and

blocking the movement of the side edge of said work piece from said control position in the direction transversely away from the stitch line at a point prior to of the stitching point relative to the direction of the feed of the work piece by applying a force to the edge of the work piece at a point spaced laterally of the control point toward the stitching line, the detection of deviation from said control point being detected sufficiently close to said blocking point so that the edge of the work piece is always detected as being deviated from the control point, whereby the step of moving the work piece back toward the control point is carried out constantly, and the work piece is supplied to the stitching point with the side edge of the work piece maintained in the control position.

2. A method of automatically guiding a work piece in a sewing machine, comprising the steps of:

continuously detecting minor deviations of the position of the side edge of a work piece from a control position only when the side edge moves in a direction toward the line of stitching in the sewing machine, said detection being effected at a point prior to the stitching point relative to the direction of feed of the work piece;

moving said work piece transversely of the stitch line back toward the control position by contacting a rotary wheel with the surface of the work piece and driving the rotary wheel in response to a detected deviation in a direction and for a time until said side edge of the work piece is brought back to said control position; and

blocking the movement of the side edge of said work piece from said control position in the direction transversely away from the stitch line at a point prior to the stitching point relative to the direction of feed of the work piece;

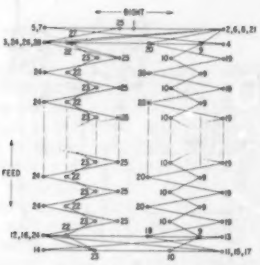
whereby the work piece is supplied to the stitching point with the side edge of the work piece maintained in the control position.

4,159,688

METHOD OF FORMING A BUTTONHOLE PATTERN

Stephen A. Garron, Elizabeth, and Charles R. Odermann, Montville, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jul. 28, 1978, Ser. No. 928,939
Int. Cl.[2] D05B *3/06*
U.S. Cl. 112—264.1 **3 Claims**



1. A method of operating a zig zag sewing machine to produce a buttonhole pattern including two spaced-apart rows of zig zag stitches, each row having a width less than one half the total width of the two parallel rows side by side, there being a separation between the two parallel rows to define the cutting space of the buttonhole pattern, said method comprising the steps of:

(a) sewing a first row of narrow zig zag cording stitches in a first direction extending the length of the buttonhole pattern, said cording stitches having a width less than the width of one of said parallel rows;

(b) sewing one of said parallel rows of zig zag stitches in a second direction opposite said first direction extending the length of said buttonhole pattern and overlying said first row of cording stitches;

(c) sewing a second row of narrow zig zag cording stitches in said first direction extending the length of the buttonhole pattern, said cording stitches having a width less than the width of one of said parallel rows, said second row of cording stitches being parallel to said first row of cording stitches and spaced therefrom by a distance greater than said cutting space; and

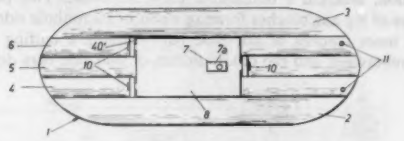
(d) sewing the second of said parallel rows of zig zag stitches in said second direction extending the length of said buttonhole pattern and overlying said second row of cording stitches.

4,159,689

WINDSURFER

Gerhard Odoj, Munich, Fed. Rep. of Germany, assignor to Semperit Aktiengesellschaft, Vienna, Austria

Filed Aug. 1, 1977, Ser. No. 820,924
Claims priority, application Switzerland, Aug. 12, 1976, 10248/76
Int. Cl.[2] B63B *35/00*
U.S. Cl. 114—39 **17 Claims**



4. In a windsurfer apparatus including a generally planar horizontal floating body member, a vertical mast connected with said body member, and sail means secured to said mast for capturing the wind to propel the windsurfer, the improvement wherein said horizontal body member comprises:

at least three successively connected parallel contiguous cylindrical inflatable members arranged parallel to the direction of travel of the windsurfer including an outer side pair of inflatable members each having a first outer diameter and inner inflatable members arranged between said outer side inflatable members each inner inflatable member having a second outer diameter, said inflatable members having longitudinal axes arranged in a common plane;

a rigid planar horizontal platform member arranged adjacent the upper surface of said inner inflatable members and approximately centrally of the length of the inflatable members, said platform member spanning the spacing distance between said pair of outer side inflatable members and having a length approximately one-third the length of the horizontal body member; and

means connecting said platform member in contiguous relation with the upper surfaces of said inner inflatable members.

4,159,690

AUTOMATIC LANDING SYSTEM FOR HYDROFOIL CRAFT

William E. Farris, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

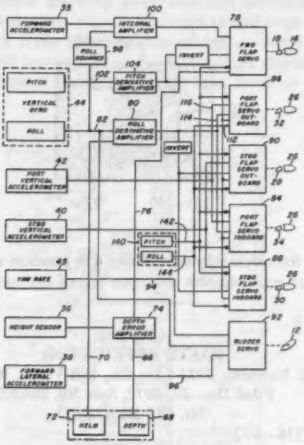
Filed Dec. 7, 1977, Ser. No. 858,237
Int. Cl.[2] B63B *1/30*
U.S. Cl. 114—275 **5 Claims**

1. In a control system for a hydrofoil craft of the type having at least one control surface, primary electrical circuit means including a primary servo system for controlling said surface during normal operation of the hydrofoil, and a primary source of electrical power for said primary electrical circuit means, the improvement of:

auxiliary electrical circuit means including a secondary servo system and a secondary source of electrical power therefor for automatically positioning said surface to cause said hydrofoil craft to descend from a foil-borne to a hull-borne mode of operation upon the occurrence of a failure in said primary power source; and

gyroscope means in said auxiliary electrical circuit means and operable when a failure in said primary power source

occurs when the hydrofoil craft is turning for automatically causing the craft to roll out of an inclined deck



attitude to an essentially level deck attitude as the craft descends to a hull-borne mode of operation.

4,159,691

MARINE CRAFT EMPLOYING BOW-WAVE LIFT

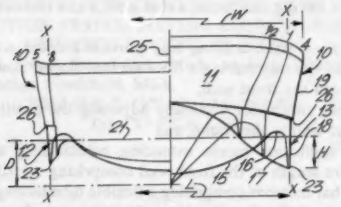
Roland K. Paxton, 13, Calbourne Rd., Carisbrooke, Isle of Wight, England

Filed Jul. 12, 1977, Ser. No. 814,821

Claims priority, application United Kingdom, Jul. 15, 1976, 29448/76

Int. Cl.[2] B63B *1/18*

U.S. Cl. 114—290 **10 Claims**



1. A marine craft comprising at least one hull, having downwardly-depending walls disposed symmetrically on each side of the longitudinal axis of the hull, so that in operation of the craft, the walls extend into the water over which the craft travels, said craft having a form defining bow and stern halves wherein, starting from a vertical plane containing the longitudinal axis of the hull and extending in a lateral direction:

(a) with respect to the bow half of the craft, the underside of the hull has symmetrical innermost parts which rise outwardly and upwardly, then symmetrical intermediate parts which curve downwardly to merge with the walls, said innermost parts gradually increasing in outward inclination as they extend sternwards;

(b) with respect to the stern half of the craft, the underside of the hull has symmetrical innermost parts which extend outwardly and upwardly, then symmetrical intermediate parts which curve downwardly to merge with the walls;

(c) said intermediate parts of said bow and stern halves, together with the walls thereof, define tunnels of inverted "U" form and having uppermost points forming a line which inclines downwardly from the bow to the stern, through which bow-wave water tending to move outwardly and rearwardly, relative to the craft hull, is diverted and accelerated by way of converging bow parts of the walls; and,

(d) the foremost parts of said walls are laterally spaced from said longitudinal axis of the hull.

4,159,692

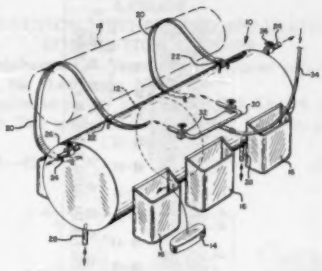
METHOD OF SUBMERGING FLOATATION BODIES AND APPARATUS FOR PERFORMING SAME

Wayne K. Dye, Jr., 1701 Clackamette Dr., Oregon City, Oreg. 97045

Filed Oct. 25, 1977, Ser. No. 844,787

Int. Cl.[2] B63G *8/00*

U.S. Cl. 114—333 **9 Claims**



5. Apparatus for positioning a high buoyancy floatation body beneath a structure floating in a body of water comprising:

(a) an elongate tank, having a top, a bottom and sides;

(b) means of releasably securing said floatation body to said tank;

(c) said tank having, when filled with water, a negative buoyancy force which is greater than the buoyancy force of said floatation body, and having a volume which is sufficient to cause said tank to float when it is filled with air;

(d) said tank being divided along its longitudinal axis into at least two isolated compartments;

(e) fluid passageway means located proximate the bottom of said tank, one entering each said compartment, for allowing water to enter and to be evacuated from said compartment;

(f) air outlet means located proximate the top of said tank, one entering each said compartment, each said air outlet means including a valve configured for selectively releasing air from its associated compartment so as to allow inflow of water into said compartment through its respective fluid passageway; and

(g) air inlet means located in the tank, one entering each said compartment, each said air inlet means including a control valve arranged for selectively admitting pressurized air into its associated compartment so as to force water out of said compartment through its respective fluid passageway means.

4,159,693

ARTICLE AND METHOD FOR ADDING MARKINGS TO A SPEEDOMETER

Roland Rappoport, 830 Turquoise, New Orleans, La. 70124

Filed Jun. 15, 1977, Ser. No. 806,693

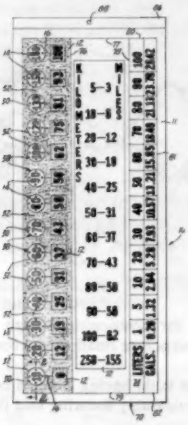
Int. Cl.[2] G01P *1/08*; G09F *3/00*

U.S. Cl. 116—62.2 **11 Claims**

1. An article for modifying an automobile speedometer of the type having a single series of miles per hour speed markings to include a series of kilometers per hour speed markings, the article comprising:

(a) a backing sheet;

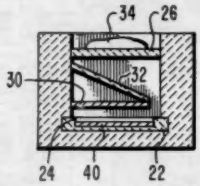
(b) a transparent sheet overlying said backing sheet;
(c) a layer of adhesive material between said transparent sheet and said backing sheet;
(d) a series of miles per hour speed markings on one of said sheets;
(e) a series of kilometers per hour speed markings on said transparent sheet, each speed marking of said kilometers per hour series being adjacent to and in registry with a marking of said miles per hour series which corresponds to the same relative speed value, each speed marking of said kilometers per hour series being disposed within a separable portion of said transparent sheet which is different from any portion of said sheet on which any other



speed marking of said second series is disposed, each speed marking of said kilometers per hour series being transparent and being defined by an opaque coating on said transparent sheet, said opaque coating surrounding each speed marking of said kilometers per hour series and filling any interstices thereof, whereby the absence of opaque material provides said transparent marking;
(f) means for separating said sheet portions from said transparent sheet, said separating means including a set of closed cuts through said transparent sheet but not through said backing sheet, each cut extending entirely around one of said separable sheet portions, whereby said sheet portions may be separately applied to an automobile speedometer to provide kilometers per hour markings thereon.

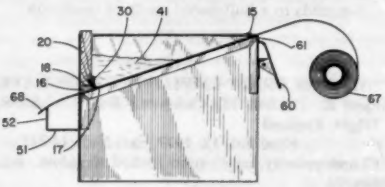
4,159,694
APPARATUS FOR DEPOSITING EPITAXIAL SEMICONDUCTOR FROM THE LIQUID PHASE
Donald P. Marinelli, Hamilton Square, N.J., assignor to RCA Corporation, New York, N.Y.
Division of Ser. No. 879,488, Feb. 21, 1978, Pat. No. 4,123,302.
This application Jul. 19, 1978, Ser. No. 926,084
Int. Cl.[2] B05C *3/00, 3/02*
U.S. Cl. 118—401 **6 Claims**

1. Apparatus for depositing on a substrate at least one epitaxial layer of a semiconductor material comprising
a boat of a refractory material having at least one well therein,
means for moving a substrate into and out of said well adjacent the bottom of the well,
means extending partially across the well adjacent the bottom of the well and adapted to form a space of small volume between it and the substrate when the substrate is in the well to provide a capillary action between the substrate and the said extending means, and



means for releasably supporting a deposition solution forming charge adjacent the open top of the well.

4,159,695
PASTE APPLICATOR
August B. Newman, 2221 Linn La., Las Vegas, Nev. 89110
Filed Dec. 27, 1977, Ser. No. 864,672
Int. Cl.[2] B05C *3/02*
U.S. Cl. 118—413 **4 Claims**



1. Apparatus for applying paste to an elongate flexible sheet of material comprising
a frame having side walls, a rear wall, and a removable front wall,
an inclined paste-holding tray portion located within said walls, the tray having a floor surface sloped downwardly toward the front wall,
fastening means for vertically adjusting the position of the front wall in the frame, and
paste applicator means extending substantially along the entire length of the front wall comprising a resilient wiping bar member comprising a flexible tube having a plurality of notches therein to distribute the paste in continuous longitudinal ridges along the sheet of material, and coaxial distributor means encased within the tube.

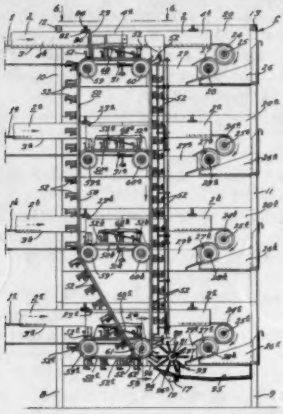
4,159,696
EGG COLLECTOR
Harlan W. Martin, New Holland, Pa., assignor to Favorite Manufacturing, Inc., New Holland, Pa.
Filed Jan. 9, 1978, Ser. No. 868,222
Int. Cl.[2] A01K *31/14*; B65G *47/08*
U.S. Cl. 119—48 **11 Claims**

2. Apparatus for offloading eggs from a conveyor belt, comprising:
an intermediate conveyor belt assembly;
means mounting said intermediate belt assembly for longitudinal movement in a run alongside said conveyor belt at a closely adjacent lower level;
said intermediate belt assembly including:
a web of belting,
a series of cups carried at spaced intervals on the topside of said belting,
each cup having a series of separated fingers outstanding

from the belting and arranged to form an egg receiving cavity;

a transfer ramp assembly overlying said intermediate belt run for depositing eggs in said cups as said cups advance;

said transfer ramp assembly comprising an array of elongated tines arranged to provide a trough sloping downwardly from a location adjacent the level of said egg



conveyor belt and toward the level of said intermediate belt assembly, said tines terminating adjacent the topside of said intermediate conveyor belting and being arranged relative to said cup fingers to interdigitate therewith as the cups advance to deposit eggs in the cups; and

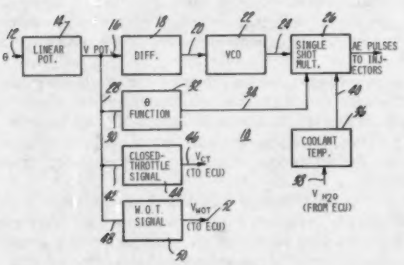
means for displacing eggs one by one from said egg conveyor belt and onto said transfer ramp assembly.

4,159,697

ACCELERATION ENRICHMENT CIRCUIT FOR FUEL INJECTION SYSTEM HAVING POTENTIOMETER THROTTLE POSITION INPUT

Charles R. Sweet, Royal Oak, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 4, 1976, Ser. No. 729,327
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EH **15 Claims**



1. An acceleration enrichment circuit for use with an electronic fuel injection system for controlling the flow of fuel to an internal combustion engine, said system including at least one injector, a throttle and an electronic control unit for controlling the operating of the injector by generating a train of output pulses to pulse the injector, the acceleration enrichment circuit modifying the output pulse train to increase the flow of fuel to the engine in response to predetermined throttle conditions, the acceleration enrichment circuit comprising:

linear potentiometer sensing means connected to the throttle for generating an analog signal proportional to the position of the throttle;

differentiator means connected to said sensing means differentiating said analog signal and generating a rate signal having an amplitude proportional to the rate of change of the throttle position in the opening direction;

voltage controlled oscillator means connected to said differentiator means for generating a frequency modulated signal in response to the amplitude of said rate signal; and

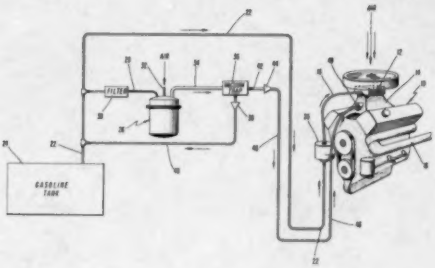
a single-shot multivibrator circuit connected to said voltage controlled oscillator means for generating a supplementary train of output enrichment pulses having a duty cycle which varies as a function of said frequency modulated signal and independent of the speed of the engine.

4,159,698

ANTI-POLLUTION METHOD AND APPARATUS FOR COMBUSTION ENGINES

Marvin Berenbaum, Las Vegas, Nev., assignor to Las Vegas Research, Inc., Las Vegas, Nev.

Continuation-in-part of Ser. No. 775,959, Mar. 9, 1977, abandoned. This application Aug. 2, 1977, Ser. No. 821,210
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—41.31 **20 Claims**



1. In an internal combustion engine having a carburetor, a supply of fuel feeding the carburetor, at least one combustion chamber receiving a fuel-air mixture from the carburetor, and anti-pollution apparatus for use in increasing the combustion efficiency of the engine, the improvement wherein said anti-pollution apparatus comprises:

first means connected with the fuel supply for producing a fuel-air vapor at a temperature below ambient; and

second means coupled with said first means and connected to the engine downstream of the carburetor for supplying said vapor to the combustion chamber, whereby said cooled vapor may be drawn into the combustion chamber ahead of each fuel-air charge from the carburetor.

4,159,699

COMPOUND ENGINES

William H. McCrum, Candlewood Mountain Rd., New Milford, Conn. 06776

Division of Ser. No. 734,638, Oct. 18, 1976, Pat. No. 4,086,882. This application Oct. 28, 1977, Ser. No. 846,579
Int. Cl.[2] F02B *75/20*
U.S. Cl. 123—59 EC **2 Claims**

1. An internal combustion compound reciprocating engine of the type operating according to the known four-stroke cycle and comprising, in combination:

(a) primary cylinders and secondary cylinders, each primary cylinder connected to at least one closely-disposed secondary cylinder by means of a conduit compounding said cylinders to form an operable engine unit and serving as a passageway carrying gases transferred and shared between said compounded cylinders during each period in which those cylinders are made to coact by sharing their expansion and exhaust events in a manner effecting a

substantial overlap and extension of those events, respectively;

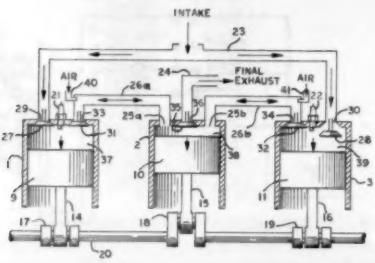
(b) each primary cylinder being a four-cycle prime mover in which fuel combustion is initiated for creating engine working medium therein;

(c) means for supplying primary air and fuel only to said primary cylinders and in quantities effecting the equivalent of ignitable fuel-rich mixtures;

(d) means for timely igniting said mixtures in the primary cylinders, respectively;

(e) means including pistons, connecting rods and a crankshaft arranged for converting the effects of combustion of the fuel into propulsive mechanical force as engine output;

(f) an exhaust valve and port in each primary cylinder serving as means for effecting coaction between compounded whereby means are provided to which gases are transferred, intermixed and shared between those cylinders caused to coact by the conduit-controlling exhaust valve in said primary cylinder via opening said exhaust valve early during the expansion event of that cylinder, and as the secondary cylinder expansion event is occurring, so as to effect an early sharing, overlapping, and compounding of those expansion events via said conduit and a substantial extension of each expansion phase of the engine's operating cycle;



(g) each said conduit connecting a primary-cylinder exhaust port to the combustion chamber of each secondary cylinder in the same engine unit whereat said conduit terminates as a constantly-open port through which gases including working medium may pass in either direction whenever said exhaust port is open, whereby the said gases are shared between the coacting compounded cylinders;

(h) each secondary cylinder adapted to operate according to a two-event work cycle and to receive secondary air and subsequently share same between coacting compounded cylinders as said working medium also is simultaneously shared by those cylinders, said secondary air serving to support the burning of leftover combustibles in said medium whereby the expansive force of said medium is increased to effect improved engine power from a given amount of fuel, combustion is made more complete within the engine, and contaminants in engine exhaust are substantially reduced; and

(i) a conventional exhaust system connected to the exhaust ports of said medium-sharing secondary cylinders for transferring therefrom the engine's final exhaust to the atmosphere.

4,159,700

INTERNAL COMBUSTION COMPOUND ENGINES

William H. McCrum, Candlewood Mountain Rd., New Milford, Conn. 06776

Continuation-in-part of Ser. No. 734,638, Oct. 18, 1976, Pat. No. 4,086,882. This application May 1, 1978, Ser. No. 901,646

Int. Cl.[2] F02B *75/20*

U.S. Cl. 123—59 EC **3 Claims**

1. An internal combustion compound reciprocating engine of the type operating according to the known four-stroke cycle and comprising in combination:

(a) primary cylinders and secondary cylinders arranged alternately in a bank of in-line cylinders, each primary cylinder distinguished from secondary cylinders by serving as a prime mover in conventional manner, and initiating a combustion phase of the engine's operating cycle as an expansion event;

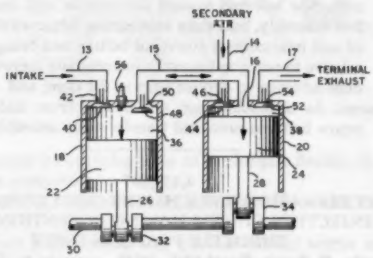
(b) means including a reciprocable piston in each cylinder, a crankshaft, and connecting rods conventionally connecting the respective pistons to said crankshaft for coverting the effects of fuel combustion into propulsive mechanical force as engine output;

(c) means for supplying primary air and fuel only to said primary cylinders and in quantities effecting the equivalent of ignitable fuel-rich mixtures;

(d) means for timely igniting said mixtures in primary cylinders to effect engine working medium;

(e) means including an intake and an exhaust port and valve in each cylinder for effecting and controlling admission, discharge and transfer of gases to, from and between the cylinders, respectively;

(f) gas transfer conduits, each compounding one primary and an adjacent secondary cylinder to form one of the engine's compound units, and particularly connecting the exhaust port of that primary cylinder to a valveless port at and forming part of the combustion chamber of that secondary cylinder, whereby means are provided to which gases are shared between those cylinders during their coaction



caused by the conduit-controlling exhaust valve in said primary cylinder via opening said exhaust valve early during the expansion event of that cylinder, and specifically as the secondary-cylinder expansion event commences, so as to effect an early sharing, overlapping, and compounding of those expansion events and a substantial extension of the expansion phase of the engine's operating cycle;

(g) each primary-cylinder exhaust valve serving as means for effecting coaction between compounded cylinders and for controlling the transfer and sharing of gases between said cylinders, the open-time duration of said valve being the total period during which those compounded cylinders coact;

(h) a separate manifold connecting intake valve ports of secondary cylinders to a conventional air filter system through which secondary air is inducted during respective intake events of those cylinders, compressed during successive compression events, respectively, and subsequently mixed with said working medium to support burning of combustibles in that medium as it is shared between coacting compounded cylinders during their combined expansion events;

(i) means for opening and closing said valves in accordance with timing required by the engine's operating cycle events regulated by said crankshaft;

(j) the cranks having crankpins disposed such that there is effected equal spacing of primary-cylinder expansion events, equally-spaced secondary-cylinder expansion

events, and alternation of said primary and secondary events in a manner causing a substantial overlap of those events as they occur in and are shared by said coacting compounded cylinders, the minimal duration of said overlap in any engine arrangement equating with 60° of crankshaft rotation; and

(k) an exhaust system for transferring the engine's final exhaust from secondary cylinders to the atmosphere.

4,159,701

SYSTEM FOR CONTROLLING FUEL SUPPLY IN INTERNAL COMBUSTION ENGINE

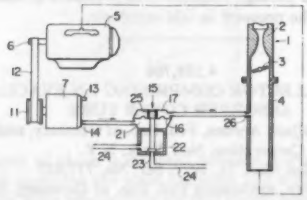
Chigaku Murata, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 3, 1977, Ser. No. 773,931

Claims priority, application Japan, Aug. 26, 1976, 51/113498[U]

Int. Cl.² F02D *31/00, 11/08*

U.S. Cl. 123—97 B **12 Claims**



1. A system for controlling fuel supply in an internal combustion engine, comprising:

an air pump driven by an output shaft of said engine; and

a pressure responsive valve including two chambers separated by a diaphragm; a valve body coupled to said diaphragm; a valve seat; said valve body and said valve seat cooperating with each other so as to open and close a fluid passage, means biasing said diaphragm and valve body in a valve closing direction, one of said two chambers being supplied a discharge pressure from said air pump whenever it is operating to act directly on said diaphragm against the bias of said biasing means and the other of said chambers being supplied a vacuum from the engine intake system, downstream of a throttle valve in a carburetor, to also act directly on said diaphragm against the bias of said biasing means.

4,159,702

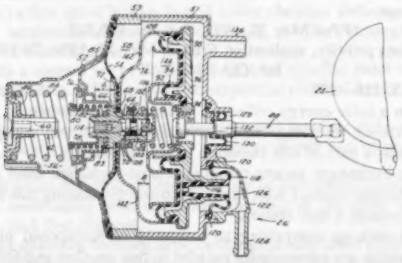
ENGINE IGNITION TIMING CONTROL WITH MULTI-STAGE ADVANCES, RETARD, AND ALTITUDE COMPENSATION FUNCTIONS

Ahmet R. Akman, Farmington, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1977, Ser. No. 864,886

Int. Cl.² F02P *5/04*

U.S. Cl. 123—117 A **30 Claims**



1. A multi-stage ignition timing control for an internal combustion engine having a carburetor mounted thereon with an induction passage connected to the engine intake manifold and having a throttle valve movable to open and close the passage, a pressure sensitive part throttle spark port opening into the passage and adapted to be traversed by the edge of the throttle valve during its opening movement to progressively vary the pressure in the port from a maximum ambient/atmospheric pressure level to the level of the manifold vacuum, an engine driven air pump providing a source of above atmospheric pressure that varies as a function of changes in engine speed, a distributor ignition timing change means having movable lever means in an initial set engine timing position movable in an advance direction from the set position to advance the ignition timing and movable in an opposite retard direction to return the lever means to the set position and beyond to retard the ignition timing, and a servo mechanism having diaphragm means operatively connected to the distributor lever means for moving the same in response to the application of the various pressures to the diaphragm means, conduit means connecting the pressure from the spark port and air pump to the servomechanism to act on the diaphragm means, first means in the servomechanism providing an advance movement of the lever means in response to the application of spark port vacuum to the diaphragm means, second means in the servomechanism providing an advance movement of the lever means in response to the application of above atmospheric pressure from the air pump to the diaphragm means, and third means in the servomechanism providing a retard movement of the lever means from the set position in response to the switching of spark port vacuum to air pump pressure to act on the first means.

4,159,703

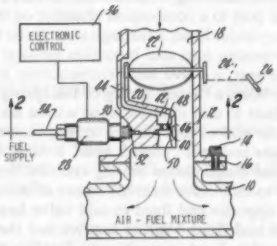
AIR ASSISTED FUEL ATOMIZER

Endre A. Mayer, Birmingham, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 10, 1976, Ser. No. 748,864

Int. Cl.² F02M *69/00;* F02D *3/00, 3/02;* F02M *69/04*

U.S. Cl. 123—139 AW **25 Claims**



1. A delivery system for providing an atomized air/fuel mixture to the intake manifold of an internal combustion engine comprising:

a throttle body connected to the intake manifold having a primary air passageway therethrough providing an air flow path from an external source to the intake manifold;

throttle valve means disposed in said throttle body for controlling the air flow through said primary air passageway in response to operator commands;

means for generating signals having a value indicative of the engine's fuel requirement;

fuel delivery means for delivering a quantity of fuel in response to said signals, said fuel delivery means including at least one fuel control valve having an input port receiving fuel under pressure from an external source and an output port outputting said quantity of fuel;

atomizer means disposed in said air passageway downstream of said throttle valve means, said means comprising an air

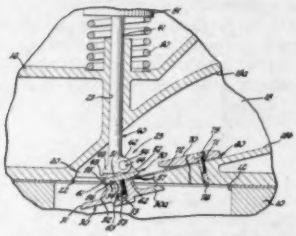
chamber having a cylindrical inner surface, a secondary air passageway conducting air from said primary air passageway upstream of said throttle valve means to said air chamber tangential to said cylindrical surface, an orifice concentric with said air chamber restricting the air flow through the said air chamber, a generally circular fuel swirl chamber disposed adjacent to said orifice, connecting means connecting the output port of said fuel control valve with said fuel swirl chamber for injecting said quantity of fuel into said fuel swirl chamber tangential to the inner surface of said fuel swirl chamber to form a fuel ring therein, and an exit port conducting the air received by said air chamber and the fuel injected into said fuel swirl chamber back into said air passageway downstream of said atomizer means.

4,159,704

ARTICULATED, SPRING-CONTROLLED INTAKE VALVE

Harold V. Wiknich, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1978, Ser. No. 892,775
Int. Cl.[2] F01L *3/00, 7/00*
U.S. Cl. 123—188 AP **3 Claims**



1. A valve controlled induction system for an internal combustion engine including a cylinder head having an induction passage therein terminating at an annular beveled valve seat defining an inlet port to a combustion chamber on the combustion side of the cylinder head, a through stem guide bore in said cylinder head opening into said induction passage concentric with said valve seat, a valve stem reciprocably journaled in said stem guide bore, a flexure spring of flat spring material, a clamp means fixed to said cylinder head within said induction passage with one end of said flexure spring secured between said clamp means and said cylinder head, a valve head, and a hinge means, said hinge means having one end thereof pivotally connected to said valve stem off-center of the axis thereof and having its opposite end fixed to said valve head, with the opposite end of said flexure spring sandwiched therebetween, whereby said valve head is positioned for movement upon reciprocation of said valve stem between a closed position at which said valve head is in seated engagement with said valve seat and an open position at which said valve head is in pivoted and axially spaced-apart relation relative to said valve seat.

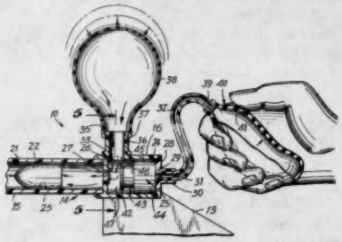
4,159,705

TOY PROJECTILE LAUNCHING DEVICE

Ian H. Jacoby, Rd. 1, Mt. Hope Rd., Middletown, N.Y. 10940

Filed Feb. 3, 1978, Ser. No. 874,856
Int. Cl.[2] A63H *33/18*; F41F *1/04*
U.S. Cl. 124—63 **7 Claims**

1. A toy pneumatic projectile launching device comprising a housing having a bore, barrel means connected to said housing for receiving and guiding a projectile to be launched, an air pressure storage reservoir connected to said bore adjacent said barrel means, a flow passage extending between said barrel means and said bore, a pilot member movably mounted in said bore for selectively closing and opening said flow passage between said barrel and reservoir, and pump means operatively connected to said bore for charging said reservoir and maintaining said pilot in said closing position responsive to super-atmospheric pressure generated by said pump means and



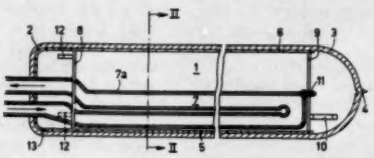
for shifting said pilot member from said closing to said opening position of said passage responsive to pressures in said pump means below the pressure in said reservoir.

4,159,706

SOLAR COLLECTOR COMPRISING AN EVACUATED ABSORBER COVER TUBE

Faramarz Mahdjuri, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,037
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1976, 2612171
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **6 Claims**



1. A solar collector, which comprises an evacuated, transparent essentially straight cover tube substantially circular in cross-section and sealed at its ends, a selective absorber associated with said cover tube, a selective heat-reflective layer provided on the inner surface of said cover tube along its entire cylindrical length and over a cross-sectional area of at least 180°, and a metallic reflective layer provided on the inner surface of at least one end of the cover tube.

4,159,707

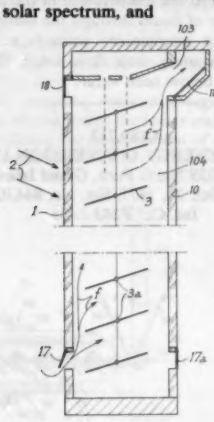
SOLAR ENERGY COLLECTOR AND INSTALLATION EMPLOYING SAME

Jean-Francois Miquel, L'Hay-les-Roses, France, assignor to Agence Nationale de Valorisation de la Recherche, Neuilly, France

Filed May 25, 1977, Ser. No. 800,527
Claims priority, application France, May 26, 1976, 76 16055
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **17 Claims**

1. In a solar energy collector, of the type comprising:
a pick-up receiving the solar radiation and converting at least a part of this radiation into heat, and
heat-exchanger means bringing a heat-exchange fluid into thermal contact with the pick-up and evacuating this fluid towards a user station,
said pick-up comprising an assembly of juxtaposed plates which are substantially parallel to one another and form a layer,
the distance between two adjacent plates is chosen so as to

constitute a well of heat in which the solar radiation is subjected to at least two reflections,
at least one of the opposite faces of this well of heat is selectively absorbent for the infrared part of the solar radiation,
the two faces of this well are substantially reflecting for the rest of the solar spectrum, and



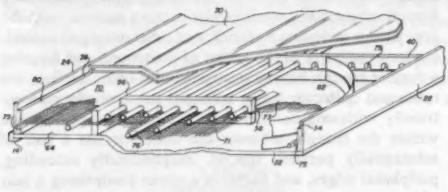
the layer of plates is disposed between a front transparent wall receiving the solar radiation and a rear wall, these walls being substantially parallel to said layer and defining therebetween an enclosure in which a heat-exchange fluid circulates.

4,159,708

SOLAR ENERGY COLLECTOR AND HEAT EXCHANGER

Donald L. Pyle, Midland, Tex., assignor to Near Star Solar, Inc., Midland, Tex.

Filed Jun. 17, 1977, Ser. No. 807,443
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **17 Claims**



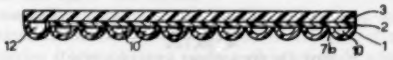
1. A solar energy collector and heat exchanger, which comprises:
(a) a housing having an open top and a closed bottom;
(b) a metallic sheet positioned in said housing to define a lower chamber;
(c) a first set of baffles in said lower chamber defining a first serpentine channel for directing air flow through said lower chamber;
(d) a second set of baffles above said metallic sheet in said housing defining a second serpentine channel for directing air flow therealong;
(e) an air inlet port extending into said housing and communicating with said lower chamber at one end of said first channel;
(f) an air outlet port extending out of said housing and communicating with the lower chamber at the other end of said first channel;
(g) structure forming flow openings in said sheet at the ends of said second channel and positioned for air flow therethrough upon air flow through said first channel;
(h) a fluid system including a tube defining a serpentine path through said housing above said metallic plate, said fluid system having an inlet and an outlet; and
(i) a transparent panel covering the top of said housing to complete an upper chamber in said housing and to permit the transfer of radiant energy from the sun to said metallic sheet and to said tube of said fluid system thereby heating air passing through the upper and lower chambers of the housing and heating fluid passing through said fluid system.

4,159,709

LOW COST SOLAR PANEL

Mario Palazzetti, Avigliana, Italy, assignor to Fiat Societa per Azioni, Turin, Italy

Filed Jul. 19, 1977, Ser. No. 816,991
Claims priority, application Italy, Jul. 20, 1976, 68809 A/73
Int. Cl.[2] F24J *3/02*; F24F *3/14*
U.S. Cl. 126—271 **3 Claims**



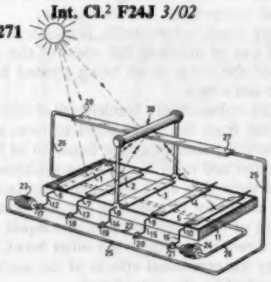
1. A solar panel for absorbing luminous and infra-red radiation for the heating of water, comprising a first plastics layer transparent to said radiation, a second plastics layer also transparent to said radiation and a third plastics layer opaque to said radiation, said second layer being secured to said third layer, a portion of said first layer being coextensive with said second layer, said first and second layers being secured together at spaced apart locations to define therebetween a plurality of interconnected preheating flow ducts, inlet means disposed between said first and second layers to provide for the supply of fluid to said preheating flow ducts, a second portion of said first layer extending beyond said second layer in spaced relation to said third layer, said second portion of said first layer being connected about the periphery thereof to said third layer to define additional flow ducts between said first and third layers in fluid communication with said preheating flow ducts and outlet means for the fluid disposed between said first and third layers.

4,159,710

SOLAR COLLECTOR COMPRISING SOLAR TRACKING MEANS

Gijsbert Prast, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,273
Claims priority, application Netherlands, Sep. 20, 1976, 7610401
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **13 Claims**



1. A solar collector, which comprises a plurality of elongate, mutually parallel individual reflectors mounted on a frame for rotation about their respective longitudinal axes, an adjusting

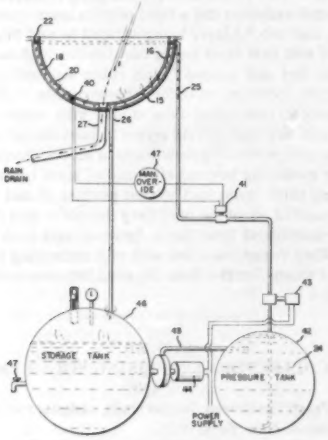
mechanism coupled to the individual reflectors for simultaneously rotating the same, an elongate absorber arranged parallel to the individual reflectors and serving to collect solar radiation focussed and concentrated thereon by the reflectors, and tracking means responsive to solar radiation for operating the adjusting mechanism, said tracking means including two elongate sensor reservoirs positioned opposite the reflectors and extending, when viewed from the reflectors, at least substantially on different sides of the absorber relative to each other, one end of each reservoir being situated in the immediate vicinity of the absorber, a vaporizable/condensible working medium partly in the liquid phase and partly in the vapour phase in each reservoir, the vapour pressure of said working medium in each reservoir being proportional during operation to the quantity of solar radiation received from the reflectors by the respective reservoirs, and means to enable the two working medium vapour pressures to act on the adjusting mechanism in mutually opposed senses to correct the focussing of solar radiation by the reflectors on the absorber in accord with any differential working medium vapour pressure.

4,159,711

SOLAR HEATING APPARATUS

George P. Johnson, 1951 Hollywood Pkwy., York, Pa. 17403

Filed Oct. 7, 1977, Ser. No. 840,157
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **9 Claims**



1. Apparatus for solar heating of water or other heat-conducting liquid, comprising, in combination:

an upwardly open, substantially hemispherical outer bowl mounted out of doors in full view of the sun, the inner surface of the outer bowl being treated to absorb heat from the sun's rays;

a transparent, substantially hemispherical inner bowl within and spaced from the outer bowl to form a substantially hemispherical passageway for liquid to be heated;

the outer bowl and inner bowl being positioned so that the planes of their rims are substantially horizontal;

dispensing means for introducing the heat-conducting liquid at the rim of the outer bowl so that liquid so introduced will run down the inside of the outer bowl, thereby being heated by the combined effects of the sun's rays and the heat absorbed by the outer bowl;

outlet means at the bottom of the outer bowl for allowing heated liquid to drain from the outer bowl at a rate at least equal to the rate such liquid is introduced;

a pressure tank containing heat-conducting liquid;

a delivery pipe connecting the liquid in the pressure tank with the dispensing means;

means for maintaining sufficient pressure on the liquid in the delivery pipe to force liquid from the pressure tank through the delivery pipe and the dispensing means, to thereby cause said liquid to run down the inside of the outer bowl; and

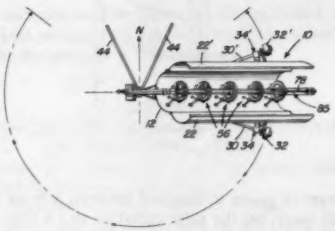
means responsive to the temperature in the passageway for permitting flow of liquid through the delivery pipe when the passageway temperature exceeds a predetermined value and preventing such flow when the passageway temperature is below such value.

4,159,712

SOLAR ENERGY CONVERSION UNIT

Howard W. Legg, 2229 North Park, Grand Island, Nebr. 68801

Filed Oct. 20, 1977, Ser. No. 844,031
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **12 Claims**



1. A solar energy conversion unit, comprising, in combination:

(a) a collector forming a focal area for radiation received from the sun;

(b) frame means for mounting the collector for movement with the sun;

(c) core means forming a fluid passage and mounted on the frame and arranged at the focal area of the collector for receiving solar radiation from the collector and heating a fluid passing through the passage formed by the core means, wherein the collector is a longitudinally extending trough substantially semicircular in cross section, with the core means including a plurality of tubes arranged extending longitudinally of the extent of the trough and forming a further trough having a semicircular cross section, the tubes and collector being arranged substantially concentrically with one another with the tubes being disposed within the trough, wherein the collector has a pair of substantially parallel, spaced, longitudinally extending, peripheral edges, and includes a cover comprising a pair of cooperating doors arranged pivotally mounted on the edges of the collector by longitudinally extending hinges for swinging movement toward and away from one another.

4,159,713

BLOOD GAS SYRINGE

Alois G. Prais, Garfield, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed Jun. 2, 1977, Ser. No. 802,786
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—765 **5 Claims**

1. A blood gas syringe, which comprises;

a barrel having a first open end for receiving a slidable plunger, a second open end adapted to mount a needle on the opening thereof and a bore communicating between said ends; and

a plunger slidably mounted in the bore of said barrel, said plunger being at least partially withdrawable from said barrel through said first open end, said plunger comprising;

(a) an elastomeric piston having an upper end and a lower end, a body joining said upper and lower ends, said body having a diameter less than the diameter of said bore, and a sealing flange radially disposed about the outer periphery of said body between the upper and lower ends, said flange forming a light sliding seal with the inner walls of said barrel;

(b) a plunger rod having a first end extending out of the first open end of said barrel and a second end within the bore of said barrel; and

(c) means for coupling without a rigid connection, said second end of said rod to the lower end of said piston, said means permitting the displacement of the first end of said rod out of axial alignment with said piston, without moving said piston out of said alignment, said means also permitting free rotation and axial movement of the rod without moving the piston, and

wherein said means comprises a stud mounted in said piston and an opening in the second end of said rod, said stud including a spacing bar component extending distally from the connection with the piston and a stud cap at the terminal end of the spacing bar, said stud spacing bar being inserted in and retained in said opening by engagement of the stud cap with the portions of said rod defining said opening, said spacing bar being of a dimension permitting the rod to float thereon without a rigid connection between rod and piston, said rod being rotatable and axially displaceable upon the spacing bar.

4,159,714

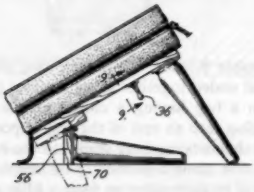
FOOTSTOOL

Samuel F. Peterson, Chicago, and Clifford E. Grube, Niles, both of Ill., assignors to Associated Mills, Inc., Chicago, Ill.

Filed Nov. 29, 1977, Ser. No. 855,609

Int. Cl.[2] A61H *21/00, 1/00*

U.S. Cl. 128—24.2 **3 Claims**



1. A footstool comprising in combination:

a rigid substantially flat base having a top and a bottom;

a plurality of leg members, at least two of said leg members rigidly attached to said bottom in an extended position and the remainder of said leg members hingedly mounted on said bottom of said base for rotation between an extended position and a retracted position, said leg members cooperating when said remainder are in said extended position to support said base in a substantially horizontal position and cooperating when said remainder are in said retracted position to support said base in a position inclined from said horizontal position;

means on said base for releasably fastening said remainder in said extended position;

a cushion on said top having an upper section and a lower section;

cooperative means defined on said top and on said lower section for releasably fastening said cushion to said base;

an electrically operated vibrating element mounted between said upper section and said lower section;

an electrically operated grid-type heating element mounted on said upper section; and

a manually operated means for controlling said heating element and said vibrating element, said control means having at least a heating mode, a vibrating mode, a heating and vibrating mode and an off mode, said control means in said heating mode permitting electrical current to flow to only said heating element, in said vibrating mode permitting electrical current to flow to only said vibrating element, in said heating and vibrating mode permitting electrical current to flow to both said heating element and said vibrating element, and in said off mode preventing electrical current from flowing to either said vibrating element or said heating element;

whereby said cushion may be used alone, on said base in said horizontal position and on said base in said inclined position to heat, massage or simultaneously heat and massage a localized portion of the body.

4,159,715

LIQUID TREATMENT APPARATUS FOR BODY CARE

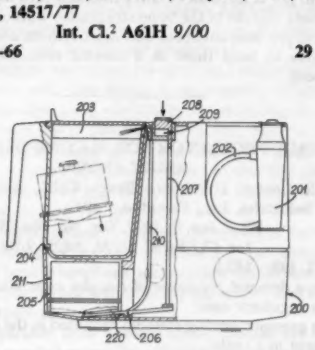
Philippe G. E. Woog, Vesenaz; Michel A. Moret, Chene Bourg; Pierre-Jean Jousson, Geneva, and Jean-Pierre Musy, Puplinge, all of Switzerland, assignors to Les Produits Associes LPA S.A., Switzerland

Continuation-in-part of Ser. No. 704,330, Jul. 12, 1976, Pat. No. 4,078,558. This application Dec. 19, 1977, Ser. No. 861,708

Claims priority, application Switzerland, Dec. 28, 1976, 16365/76; Dec. 28, 1976, 16366/76; May 26, 1977, 6484/77; Nov. 28, 1977, 14517/77

Int. Cl.[2] A61H *9/00*

U.S. Cl. 128—66 **29 Claims**



1. Apparatus for personal hygiene, in particular for oral hygiene comprising:

a casing, a reservoir fitted on the casing for containing a liquid supply, a dispenser of an additive for addition to the liquid in the reservoir, the casing including means for receiving the dispenser, the receiving means comprises a housing situated below the reservoir, means for connect-

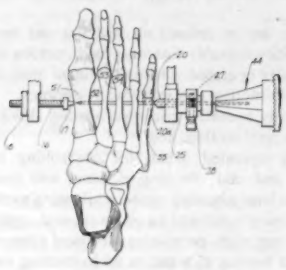
ing the outlet of the dispenser to the interior of the reservoir, and means for activating said dispenser.

4,159,716

METHOD OF COMPRESSING AND REALIGNING BONE STRUCTURES TO CORRECT SPLAY FOOT

Clinton H. Borchers, 740 Reading Rd., Mason, Ohio 45040

Filed Oct. 17, 1977, Ser. No. 842,625
Int. Cl.[2] A61F *5/00*; A61B *17/18*
U.S. Cl. 128—80 R **1 Claim**



1. A method of compressing and realigning animal bone structures and passing a drill pin therethrough to retain said structures in a desired alignment, as applied to the correction of splay foot deformity in the human foot, comprising the steps of aligning two adjustable members on opposite sides of said bone structures of said human foot, one of said members being aligned on the medial side of the first metatarsal shank and the other of said members being aligned on the lateral side of the fifth metatarsal head, moving said members inwardly toward and in axial alignment with one another, thereby compressing and realigning said bone structures, clamping said members in relatively immovable positions, inserting a threaded drill pin through an axial passage in one of said members, advancing said drill pin by rotation thereof through said passage toward the other of said members and in axial alignment therewith through said fifth metatarsal head, under the fourth, third and second metatarsal shafts successively, and into said first metatarsal shank, thereby causing said drill pin to pierce and traverse said bone structures, stopping the advance of said drill pin when the end thereof has penetrated the interior of the most remote therefrom of the bone structures, and severing said drill pin at its point of entry into said fifth metatarsal head, the closest thereto of the bone structures, whereby a portion of said drill pin interconnects said most remote and closest bone structures to hold them in a desired relatively compressed alignment.

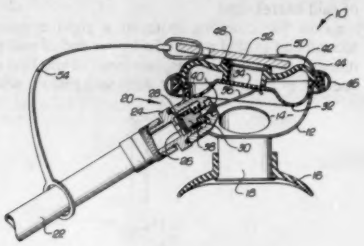
4,159,717

ANTISET PROTECTOR FOR SECOND STAGE SCUBA REGULATORS

Mike R. Cossey, Huntington Beach, Calif., assignor to Under Sea Industries, Inc., Compton, Calif.

Filed Jun. 7, 1977, Ser. No. 804,231
Int. Cl.[2] B63C *11/16*; A62B *9/02*
U.S. Cl. 128—142.2 **5 Claims**

1. In a demand regulator of a scuba apparatus:
(a) a regulator case;
(b) a pressure sensing element mounted in the case for movement in a path;
(c) means forming in the case, an inhalation chamber exposed to one side of the sensing element;
(d) means forming in the case, an ambient chamber exposed to the other side of the sensing element, there being at least one access opening through the case to said ambient chamber;
(e) a demand valve attached to the case and having a valve closure, and a seat relatively movable to admit breathable gas into said inhalation chamber, and a resilient sealing element between the closure and the seat;
(f) spring means urging said closure and seat to clamp the sealing element between the seat and the closure;
(g) linkage means between the sensing element and said demand valve to move said valve closure and seat away from each other entirely to free the sealing element from clamping engagement in response to a reduction in pressure in said inhalation chamber; the combination therewith of:



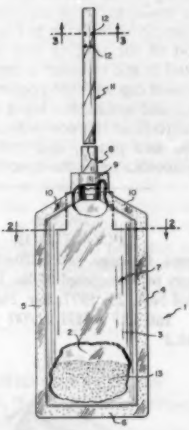
(h) spacer means selectively interposed between said sensing element and said case and retractable from within said case and operative to move and hold said closure and seat entirely away from each other whereby, during storage or nonuse of said demand regulator, said resilient sensing element is entirely uncompressed and thereby protected from compression set.

4,159,718

DISPOSABLE DOUCHE

Earle S. Bower, 633 Third Ave., New York, N.Y. 10017

Filed Jul. 19, 1977, Ser. No. 817,049
Int. Cl.[2] A61M *7/00*
U.S. Cl. 128—248 **7 Claims**



1. A disposable douche comprising two sheets of a thin plastic material sealed together along a major portion of their edges to form a bag having a closed end, a tubular joiner section extending into an end of the bag opposite said closed end with said sheets being heat sealed to the outer surface of said joiner section along a portion of its length to form a permanent seal and to each other to form a filler end of the bag, and an axially slidable tubular probe section sealingly engaging the interior of said tubular joiner section whereby when said probe is axially slid from said joiner section the bag may be filled with a liquid through said joiner section and whereby

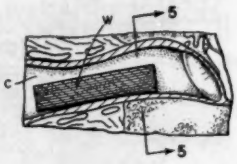
when said probe is axially slid into said joiner section said douche is ready for use.

4,159,719

MOISTURE-EXPANDABLE EAR WICK

Raymond H. Haerr, Cincinnati, Ohio, assignor to Xomed, Inc., Cincinnati, Ohio

Filed May 9, 1977, Ser. No. 794,917
Int. Cl.[2] A61F *1/18;* A61M *31/00*
U.S. Cl. 128—260 **10 Claims**



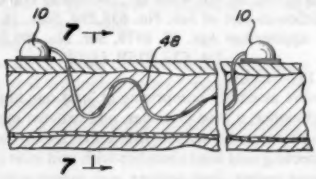
1. An elongate, spirally wound, compressed moisture-expandable ear canal wick for applying medicament to the interior surface of an ear canal, the wick comprising an initially flat length of moisture-expandable dehydrated sponge-like material said material being coiled up and compressed into an elongate device which is insertable into an ear and has a pair of ends and an outside diameter of approximately 2 to 3 mm, said material being characterized in that when hydrated by a liquid medicament said material uncoils so that the outer surface of said elongate device engages the interior surface of an ear canal in which the device is inserted prior to hydration, said outer surface contacting an ear canal inner surface to apply medicament to the interior surface of the ear canal, said uncoiling causing said device to expand radially outward and defining an open, unobstructed passage through the wick, said passage extending longitudinally of said device for essentially the entire length thereof and connecting said device ends together and permitting substantially free unobstructed passage of sound waves through the wick from one end of said device to the other end thereof whereby a user's hearing is essentially unimpaired when said wick is positioned within said user's ear canal and expanded into contact with the inner surfaces of that ear canal, said material being characterized such that when hydrated while unconfined said device will expand and completely uncoil to its original flat, non-compressed dimensions.

4,159,720

INFUSION OF LIQUIDS INTO TISSUE

Andrew F. Burton, 1453 Whittier Pl., NW., Washington, D.C. 20012

Filed Nov. 28, 1977, Ser. No. 855,451
Int. Cl.[2] A61M *31/00*
U.S. Cl. 128—260 **16 Claims**



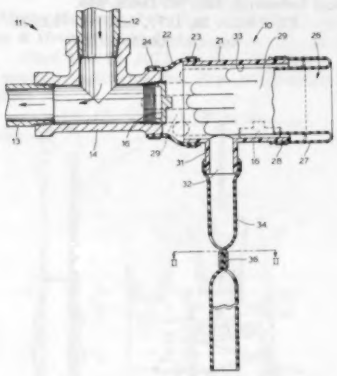
1. A means for treating the living subcutaneous tissue of a body, the means including wick means for continuously delivering a medicinal or other prescribed fluid from temporary reservoir means in which the liquid is stored, said reservoir means having a surface contoured to a portion of and releasably attached to that portion of the body containing the tissue to be treated, comprising an elongated flexible wick means of substantial length which is adapted to be installed in the tissue to be treated, said wick means having a known rate of absorption for said fluid to feed fluid into said tissue, at least one end of said wick means being in contact with the fluid in said reservoir means, needle means for engaging with the other end of said wick means to lead said wick means into its installed position and then be disconnected from the wick means, and said wick means following in the path through which said needles means is guided during installation of the wick means in the tissue so that the wick means is led to a desired position so as to feed the absorbed fluid directly to the area in the tissue needing attention.

4,159,721

SANITARY PRESSURE RELIEF DEVICE

Robert Horter, 11740 Maywood Dr., Sparta, Mich. 49345

Filed Jun. 30, 1977, Ser. No. 811,465
Int. Cl. F16k *43/00*
U.S. Cl. 137—317 **5 Claims**



1. In a pressure relief device for attachment to a drain clean-out fitting having a removable plug for permitting controlled discharge of liquid from a drain system, the improvement wherein said pressure relief device comprises:

a rigid sleeve defining therein a chamber and having first and second openings formed in the opposite axial ends thereof for communication with said chamber;

releasable annular seal means for creating a sealed fluid-tight engagement with said fitting in surrounding relationship to the removable plug, said seal means including an axially elongated seal sleeve of flexible rubberlike material having one end thereof connected to and sealingly engaged with said body in surrounding relationship to said first opening, said seal sleeve having the other end thereof sealingly connectible to said fitting;

discharge conduit means connected to said rigid sleeve and communicating with said chamber for permitting discharge of liquid therefrom, said conduit means being fixed to the peripheral sidewall of said rigid sleeve intermediate the ends thereof;

manually operable flow control means connected to said discharge conduit means for selectively opening and closing same;

flexible boot means fixedly connected to said rigid sleeve in surrounding relationship to said second opening for sealingly closing same, said boot means including an elongated flexible glove portion which is insertable into and through said rigid sleeve for permitting engagement with the plug and removal thereof from the fitting;

said boot means also including a flexible sleeve portion integrally connected to said flexible glove portion, said sleeve portion being engaged with said rigid sleeve in surrounding relationship to said second opening; and

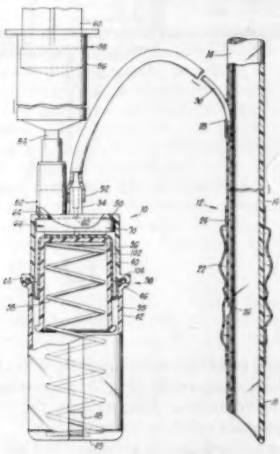
releasable clamping means coacting with said sleeve portion and said rigid sleeve for holding said sleeve portion in clamped and sealed engagement with said rigid sleeve, said clamping means being releasable to permit removal of said boot means from said rigid sleeve.

4,159,722

PRESSURE REGULATOR FOR ENDOTRACHEAL TUBE CUFF OR THE LIKE

Clarence L. Walker, Webster Groves, Mo., assignor to Sherwood Medical Industries, Inc., St. Louis, Mo.

Filed Mar. 28, 1977, Ser. No. 782,221
Int. Cl.[2] A61M *25/00*
U.S. Cl. 137—496 **14 Claims**



1. An improved pressure regulator for regulating the fluid pressure in an inflatable cuff on an endotracheal tube or the like comprising:

a pressure regulator housing;

means defining first and second openings in said pressure regulator housing; said first opening being adapted to be connected to an inflatable cuff, and said second opening being adapted to be connected to a source of fluid under pressure for inflating an inflatable cuff connected to said first opening;

a valve housing disposed in said pressure regulator housing; said valve housing defining a valve chamber in fluid communication with said first and second openings;

a valve member disposed in said valve chamber;

a piston chamber in said pressure regulator housing exterior of said valve chamber;

a piston member in said piston chamber; and

means defining a fluid flow passage between said valve chamber and said piston chamber;

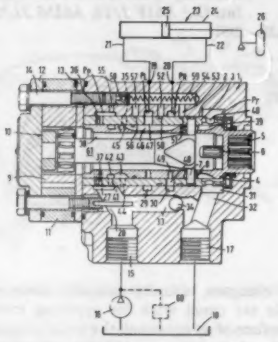
said valve member being responsive to relatively rapid increases in fluid pressure in said first opening in said housing to block said fluid flow passage between said valve chamber and said piston chamber.

4,159,723

CONTROL DEVICE FOR STEERING APPARATUS OR THE LIKE

Johannes V. Baatrup, and Ivar Rasmussen, both of Sonderborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Feb. 3, 1978, Ser. No. 874,886
Int. Cl.[2] F15B *13/04*
U.S. Cl. 137—596.13 **2 Claims**



1. A control device for steering apparatus or the like comprising a housing having (1) a longitudinally extending bore (2) inlet and outlet ports and (3) two motor ports, outer and inner rotary slide members disposed in said bore and having supply, exhaust and switching passages interconnecting said ports, switching means wherein said slide members are in axially fixed relation relative to each but have limited rotary movement relative to each other to cause switching of said passages for alternately and selectively connecting said inlet port to either one of said motor ports and said outlet port to the other one of said motor ports, two axially spaced annular grooves being formed in the interface between said bore and said outer rotary slide member being respectively connected to said motor ports, said inner slide member having a steering shaft connection, a measuring motor connected to said inner slide member having the input side thereof connected to said inlet port and the output side thereof selectably connectable to either of said motor ports, three axially spaced auxiliary annular grooves formed in the interface between said housing bore and said outer rotary slide member in straddling relation to said two motor port annular grooves to impede the shortcircuiting flow of pressure fluid between said motor ports and from one of said motor ports to said outlet port, means for pressurizing all of said auxiliary annular grooves for all rotary positions of said inner slide member including the neutral position thereof.

4,159,724

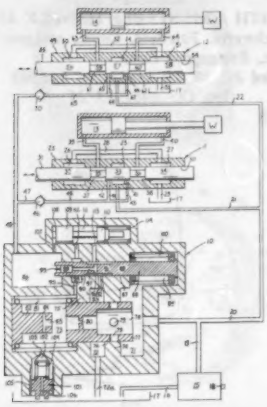
LOAD RESPONSIVE CONTROL VALVE

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 635,294, Nov. 26, 1975. This application Apr. 10, 1978, Ser. No. 895,041
Int. Cl.[2] F15B *13/08*
U.S. Cl. 137—596.13 **20 Claims**

1. A valve assembly comprising at least one housing having an inlet chamber, a load chamber, and exhaust means communicable with reservoir means, first valve means for selectively interconnecting said load chamber with said inlet chamber and said exhaust means, load sensing port means selectively communicable with said load chamber by said first valve means, bypass valve means between said inlet chamber and said exhaust means having actuating means, pilot valve means having signal generating means responsive to pressure differential between pressure in said inlet chamber and pressure in said load sensing port means, said signal generating means of said pilot valve means operable through said actuating means of said bypass valve means to vary bypass flow between said inlet

chamber and said exhaust means to maintain a constant pressure differential between said inlet chamber and said load sensing port means when pressure in said load sensing port means is above a certain predetermined level, and unloading



valve means having means responsive to pressure in said pressure sensing port means, said unloading valve means operable through said actuating means of said bypass valve means to lower pressure in said inlet chamber when pressure in said load sensing port means is below said certain predetermined level.

4,159,725

APPARATUS FOR TENSIONING AND LOCKING HOOPING BANDS

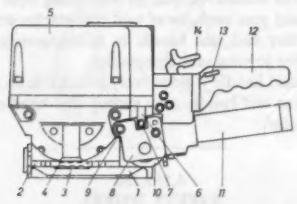
Hans Bachmann, Fahrweid, and Ernst Albiez, Widen, both of Switzerland, assignors to Borbe-Wanner AG., Switzerland

Filed Nov. 28, 1977, Ser. No. 855,190

Claims priority, application Switzerland, Dec. 3, 1976, 15274/76

Int. Cl.² B21F 9/02

U.S. Cl. 140—93.2 **8 Claims**



1. An apparatus for tensioning a strap about a package and locking the strap by permanently deforming two superimposed portions thereof, comprising

a tensioning roller;

first thrust drive means coupled to said tensioning roller for moving said tensioning roller toward and away from the superimposed portions;

motor drive means coupled to said tensioning roller for rotating the tensioning roller in a direction to tension the strap;

a locking device;

second thrust drive means coupled to said locking device for moving said locking device toward the superimposed portions to deform same and away from the superimposed portions; and

control means operably coupled to said motor drive means and said second thrust means for deactivating said motor drive means and actuating said second thrust means to move said locking device toward the superimposed portions when the tension of the strap exceeds a predetermined value, said control means comprising

a thrust rod,

rotary cam means, coupled to said rod and said motor drive means, for rotating in response to a frictional force exerted thereon by said motor drive means and corresponding to the tangential force exerted on said tensioning roller for moving said rod in one direction,

spring biasing means coupled to said rod for resiliently biasing said rod in a direction opposite to said one direction, and

retaining lever means coupled to said second thrust means and to said rod for maintaining said locking device in a position away from the superimposed portions when said rod is in a first position and for permitting said locking device to move toward the superimposed portions when said rod is in a second position.

4,159,726

LIQUID FILLING DEVICE WITH AUTOMATIC SHUT-OFF SENSOR

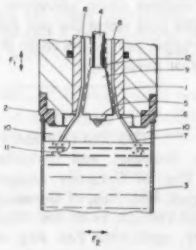
Manfred Mette, Hamburg, Fed. Rep. of Germany, assignor to Ortmann & Herbst GmbH, Hamburg, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 853,244

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1976, 2653246

Int. Cl.² B65B 3/26, 31/00

U.S. Cl. 141—40 **7 Claims**



1. A device for filling liquid containers and having a housing with a lower edge and including a valve for automatically shutting off the flow of liquid into said containers at a preselected level comprising:

a. a sealing means (2) mounted on said lower edge of said housing engaging the outer edge of said container with an airtight seal;

b. a dispensing tube (1) mounted in said housing and connected to said valve, having means by which the liquid falls freely downwardly and outwardly in a paraboloid bell-shaped stream into said containers;

c. a return air pipe (4) having an opening (15) mounted within said dispensing tube;

d. sensor means mounted on said housing and located in the space enclosed by said bell-shaped stream and activated by the presence of liquid droplets;

e. signal carrying means operatively connecting said sensor means and said valve for shutting off the liquid flow to said containers before said pre-selected level reaches said sensor means; and

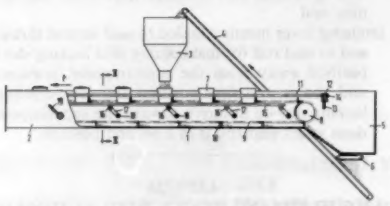
f. said bell-shaped stream (7) forms a pocket of trapped air in an outer area (10) which is enclosed and sealed airtight between said bell-shaped stream (7) said container (3) said sealing means (2) and dispensing tube (1) until the rising liquid in said container causes said bell-shaped stream to collapse and to spatter liquid droplets onto said sensor when said liquid reaches a predetermined level below said sensor, thereby activating said sensor and terminating the filling of said container.

4,159,727

POTTING AND REPOTTING MACHINE

Anthony Visser, 's-Gravendeel, Netherlands, assignor to Visser Tuinbouwtechniek en Hout B.V., 's-Gravendeel, Netherlands

Filed Jan. 27, 1978, Ser. No. 873,066
Claims priority, application Netherlands, Jan. 27, 1977, 7700839
Int. Cl.[2] B65B *1/04*
U.S. Cl. 141—131 7 Claims



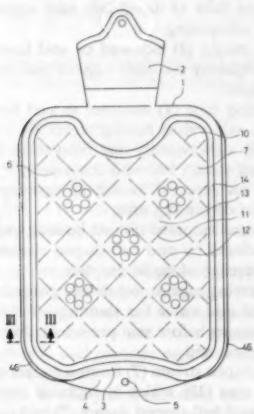
1. In a potting and repotting machine which forms part of an apparatus for filling pots, in particular filling with potting soil of flower pots and the like, said machine being provided with an elongated bin which is open at the top and accommodating an endless chain conveyor fitted with carriers extending transversely to the transport direction, the improvement comprising at least one continuous pot guideway extending in longitudinal direction of the bin, and having a variable width and depth, the carriers of the endless chain conveyor comprising pushing means to push the pots along the pot guideway, said carriers extending in the upper part of the chain above the bottom level of the guideway or guideways.

4,159,728

HOT WATER BAG

Friedrich Kraus, Stuttgart, and Berthold Kalbas, Krumbach, both of Fed. Rep. of Germany, assignors to Gummi-Kraus GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,891
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1977, 7707739[U]
Int. Cl.[2] A61F *7/04*
U.S. Cl. 150—2.1 7 Claims



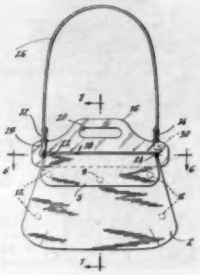
1. A hot water bag having a substantially rectangular configuration and a filling neck at a narrow side thereof, comprising in combination two heat radiating side walls made of a soft, rubber-like synthetic material, a pliant coat provided on at least one of said side walls and including a plastic foil and an underlining of foam material connected to said foil, the periphery of said foil being secured to said side wall by welding.

4,159,729

HANDBAG WITH ADJUSTABLE HANDLE AND STRAP

Lawrence B. Schwartz, Fairfield, Conn., assignor to Acricite Company, Inc., Bridgeport, Conn.

Filed Jul. 28, 1978, Ser. No. 928,903
Int. Cl.[2] A45C *13/26*
U.S. Cl. 150—33 11 Claims



1. An adjustable handbag including:

a first and second receptacle and means positioned between said receptacles for joining said receptacles together;

said first and second receptacles each having front and rear surfaces, said means for joining said receptacles being formed of a flexible material such that said first and second receptacles can be folded relative to each other so that said respective rear surfaces are adjacent to each other,

means on said rear surfaces for selectively detachably affixing said rear surfaces to each other,

a handle defining a slot, said slot being of sufficient dimension to receive either said first or second receptacle, said handle being slideable along either of said receptacles until said slot engages with said means for joining said first and second receptacles,

said first and second receptacles depending from said handle when said rear surfaces of said receptacles are affixed to each other and said handle is in engagement with said means for joining said receptacles,

whereby said handle is selectively attachable to and removable from said handbag by sliding said handle along said receptacles.

4,159,730

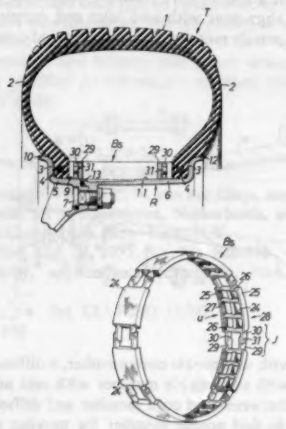
SAFETY WHEEL

Isao Osada, Izumi, and Shoichi Sano, Tokorozawa, both of Japan, assignors to Ohtsu Tire & Rubber Co., Ltd., Izumi-ohtsu and Honda Gikenkogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jul. 7, 1977, Ser. No. 813,770
Claims priority, application Japan, Jul. 17, 1976, 51-85408
Int. Cl.[2] B60C *5/00, 17/00*
U.S. Cl. 152—158 13 Claims

1. A safety wheel comprising a circumferentially divided rim having a pair of spaced opposite flanges, a tubeless tire mounted on said divided rim about the periphery thereof, and an annular bead lock fitted in said tire to grip the bead portions thereof in co-operation with said flanges of said divided rim thereby to hold the bead portions against axial displacement relative to said divided rim, said bead lock comprising an endless train of rigid lock elements and flexible joint means flexibly connecting the rigid lock elements for movement between a fully expanded circular configuration and a retracted configuration and wherein in the expanded fully con-

figuration the lock elements fit over the periphery of the medial portion of said divided rim and in the retracted configura-



tion the lock elements lie in the plane of said tire within the inner peripheral circle thereof.

4,159,731

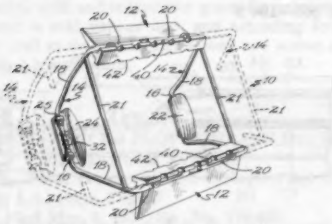
TRACTION DEVICE

Gerald L. Dyrdahl, Rte. 1 - Box 198A, Bagley, Minn. 56621

Filed Aug. 19, 1977, Ser. No. 826,043

Int. Cl.[2] B60C *27/20, 27/04*

U.S. Cl. 152—228 **8 Claims**



1. A traction device for assisting a drive wheel of a vehicle in gaining traction on slippery surfaces comprising a pair of traction plates adapted to overlie the rolling surface of a vehicle tire at circumferentially spaced intervals therearound, a pair of generally U-shaped tire side wall gripping elements each having a bight portion and radially outwardly extending legs, the free end portions of the legs of each gripping element connecting the ends of said plates and maintaining said plates in spaced relation to one another, traction increasing means on said plates projecting both radially outwardly and inwardly therefrom for respectively contacting the surface engaged by the rolling surface of the tire and the tread surface of the tire on which the device is mounted, a spring loaded spirally arcuate shoe swingably mounted adjacent one end thereof on the bight portion of one of said gripping elements and curving inwardly toward the tire side wall and then away from the tire side wall, said spring normally biasing said shoe axially inwardly for engagement with the tire side wall to retain the device in place on the tire when in use.

4,159,732

METHOD OF CASTING

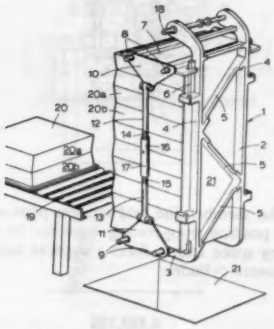
Herbert K. Handkammer, 76 Guinions Rd., High Wycombe, Buckinghamshire, England

Filed Jun. 13, 1977, Ser. No. 805,713

Claims priority, application United Kingdom, Jun. 11, 1976, 24286/76

Int. Cl.[2] B22C *9/20;* **B22D** *33/04*

U.S. Cl. 164—137 **6 Claims**



1. A method of casting utilizing boxless molds, the method comprising the steps of:

(1) conveying molds at a first level to a frame maintained in a vertical position, the frame comprising a lower support surface for molds and a rear abutting plate, the lower support surface being initially substantially at the first level;

(2) stacking a plurality of boxless molds one on another in the frame to form a substantially vertical stack, each mold being in a substantially horizontal position and abutting against the rear plate;

(3) lowering the frame into a pit therebeneath during stacking of the molds on the frame, so as to maintain the top surface of the uppermost mold substantially at the first level;

(4) lifting said frame from said pit and securing the molds within the frame, then pivoting the frame with the molds therein to an angle of approximately 90° so that each mold stands substantially vertically, the molds resting upon the abutting plate; and

(5) filling the molds with molten metal while maintaining the molds in the substantially vertical position.

4,159,733

MOLDING MACHINE

Masanobu Kuroda; Kazuo Noda, both of Kumagaya, and Shinichi Kobayashi, Fukaya, all of Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Feb. 14, 1978, Ser. No. 877,618

Int. Cl.[2] B22C *15/08*

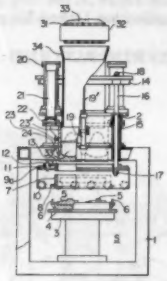
U.S. Cl. 164—211 **7 Claims**

1. In an improved molding machine including upper and lower sections, a molding table disposed in said lower machine section and adapted to support thereon at least one pattern around which sand is formed into a mold, a squeeze means including at least one fluid-actuated squeeze cylinder disposed at a level above said molding table and squeeze plate means operatively associated with said squeeze cylinder so that said squeeze plate means is substantially vertically moved into and out of squeezing engagement with a sand mold around said pattern, and rapping means disposed in said upper machine section,

the improvement which comprises:

an open-topped hollow tubular member operatively connected to said squeeze cylinder;

said squeeze plate means being mounted on said tubular member for pivotal movement between open and closed positions to open and close the bottom of said tubular member;



said tubular member and said squeeze plate means when in closed position cooperating together to define a sand retaining space and to form a squeeze head operable by said squeeze cylinder.

4,159,734

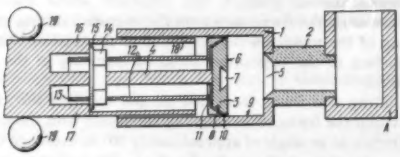
CONTINUOUS CASTING APPARATUS

Vladimir T. Sladkoshteev, ulitsa Dzerzhinskogo, 34, kv. 11; Oleg A. Shatagin, ulitsa Melnikova, 47, kv. 9; Samuil F. Khalemsky, ulitsa Kharkovskikh divizy, 7/1, kv. 31; Viktor V. Sachko, ulitsa Danilevskogo, 10, kv. 147/148; Ivan A. Yakunin, ulitsa Zernovaya, 6/4, kv. 87, and Boris F. Abraimov, ulitsa 23 Avgusta, 47, kv. 65, all of Kharkov, U.S.S.R.

Filed Jan. 26, 1977, Ser. No. 762,733

Int. Cl.[2] B22D *11/08*

U.S. Cl. 164—426 **3 Claims**



1. A continuous casting apparatus comprising a tundish; a mold connected to said tundish by a refractory conduit capable of withstanding a plurality of casting cycles; a dummy-bar fed into said mold and equipped with a head section packed with a heat-resistant material on its surface adjacent the mold walls, sides of said dummy-bar head adjoining the mold wall being formed with bevelled portions decreasingly tapering in the direction of withdrawal of the cast ingot from the mold, said bevelled portions together with the mold wall forming a gap expanding in the direction of withdrawal of the cast ingot; and a sealing material placed in said gap and means for tamping the seal into position, said means for tamping being disconnectable relative to the dummy-bar head and located behind the dummy-bar head.

4,159,735

PLATE-FIN HEAT EXCHANGER WITH CONTROLS THEREFOR

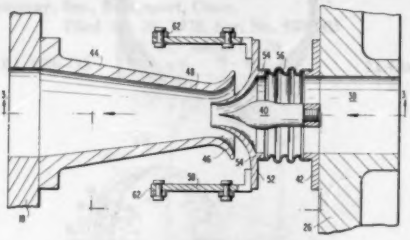
J. Hilbert Anderson, York, Pa., assignor to Sea Solar Power, York, Pa.

Filed Oct. 28, 1977, Ser. No. 846,319

Int. Cl.[2] B60H *1/00;* **F25B** *41/04;* **F04F** *5/48*

U.S. Cl. 165—40 **9 Claims**

1. A control for a heat exchanger having a plurality of plates arranged in pairs in spaced parallel relation to one another with each pair of plates defining a passage therebetween and each pair of plates defining a passageway between adjacent pairs of plates, cover members for the top, bottom and sides of said plates, one of said cover members having a liquid inlet and a vapor outlet, a nozzle core member connected to said cover member in alignment with said inlet and certain of said passageways, a nozzle member suspended in said cover member in



alignment with said nozzle core member, a diffuser arranged in alignment with said nozzle member with said nozzle member interposed between said core member and diffuser and means connected to said nozzle member for moving same towards and away from said core member and said diffuser to control the liquid flowing through said inlet and into said passageways.

4,159,736

METHOD OF AND ARRANGEMENT FOR THE SEASONAL STORAGE AND USE OF HOT WATER PRODUCED IN PARTICULAR BY ELECTRICAL POWER-GENERATING THERMAL AND NUCLEAR STATIONS

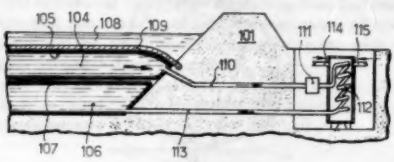
Louis H. D. Denis, Puteaux-Bellini; Abel J. H. Bedue, Versailles, and Jacques Malherbaud, Chatou, all of France, assignors to Technip, Rueil-Malmaison, France

Filed Mar. 18, 1976, Ser. No. 668,000

Claims priority, application France, Mar. 20, 1975, 75 08747; Jun. 19, 1975, 75 19253; Aug. 27, 1975, 75 26419

Int. Cl.[2] F28D *17/04;* **F24H** *7/00;* **F01K** *3/02*

U.S. Cl. 165—104 S **6 Claims**



1. A large-capacity tank for seasonal storage of hot water, produced for example by electric power-generating thermal and nuclear stations, and for their seasonal use, for example for the heating of buildings, comprising:

a water containing basin of large surface area;

two superposed individual inflatable pockets contained in said basin, the bottom pocket being for storage of cold water, and the upper pocket being for storage of hot water at a temperature near 90° C., both of said pockets lying under water contained in said basin;

at least one of said pockets having an impervious plastic sheet deformable wall located between the contents of said upper and bottom storage pockets;

first means coupled to said bottom storage pocket for supplying and recovering cold water stored in said bottom storage pocket;

second means coupled to said upper storage pocket for supplying and recovering hot water stored in said upper storage pocket; and

means coupled to said first and second means for controlling the flows of water such that an instantaneous supply of hot

water into said upper storage pocket is balanced by a corresponding drawing off of cold water into said bottom storage pocket, and such that an instantaneous drawing off of hot water into said upper storage pocket is balanced by a corresponding supply of cold water into said bottom storage pocket, said bottom and upper storage pockets providing together a substantially constant volume body of storage water.

4,159,737

HEAT PIPE

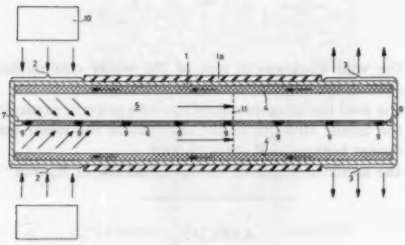
Udo K. P. Biermann; Willem L. N. van der Sluys, and Johannes C. M. Roelofs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,478

Claims priority, application Netherlands, Nov. 8, 1976, 7612360

Int. Cl.² F28D *15/00*

U.S. Cl. 165—105 **7 Claims**



1. A heat pipe which comprises a closed reservoir having at least one vaporization wall and at least one condensation wall; a heat transport medium in said reservoir for flowing in the vapour phase from the vaporization wall via at least one duct for vapour to the condensation wall during operation and for returning in the liquid phase via at least one duct for liquid to the vaporization wall; and at least one getter for gaseous impurities provided in said vapour duct and extending from the vaporization wall to the condensation wall and active at least at the operating temperature.

4,159,738

FAN-ASSISTED FORCED FLOW AIR-COOLING HEAT EXCHANGER SYSTEM

Marcel Sedille, Paris, France, assignor to Societe des Condenseurs Delas S.A., Paris, France

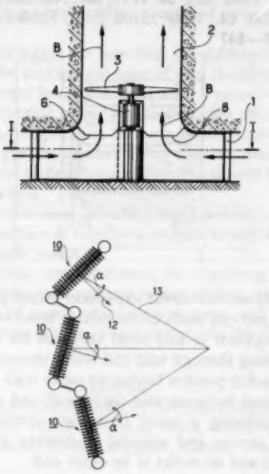
Filed Mar. 8, 1977, Ser. No. 775,686

Claims priority, application France, Mar. 8, 1976, 76 06528

Int. Cl.² F28F *13/06*

U.S. Cl. 165—125 **5 Claims**

1. In a forced flow system for heat exchange between a first fluid flowing inside ducts of a set of flat planar heat exchangers and a second fluid passing over the outside surfaces of the heat exchangers, said system including a vertical chimney terminating at its bottom in a radially enlarged chamber opening horizontally to admit air flow to said chimney, a fan placed in said chimney above said chamber and said heat exchangers positioned within said chamber such that said second fluid passes over the outside surfaces of the heat exchangers, the improvement wherein said heat exchangers are vertically oriented, are positioned within said chamber at a radial distance in excess of the radius of said chimney, constitute a circumferential array, and are angularly oriented relative to each other, and said heat exchangers including means defining horizontal air flow paths through said heat exchangers such that the streams of said second fluid emerging from the heat exchangers form on the average, in a plane perpnedicular to the axis of rotation of the fan, an angle α with the local radii emenating from the meeting point of said axis with said perpendicular plane, said angle α being calculated such that during average operation of the assembly, the angular momentum of said second fluid in relation to the axis of the fan, at the output of the heat exchangers, is substantially equal but in the opposite direction to the angular momentum imparted to said second fluid by the rotation of the fan, such that the angular momentum resulting from the second fluid in relation to the axis of the fan will be close to zero at the output of the fan.



4,159,739

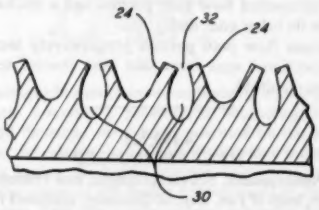
HEAT TRANSFER SURFACE AND METHOD OF MANUFACTURE

Warren S. Brothers, Skaneateles, and Albert J. Kallfelz, Camillus, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 13, 1977, Ser. No. 815,116

Int. Cl.² F28F *1/36, 13/02*

U.S. Cl. 165—133 **8 Claims**

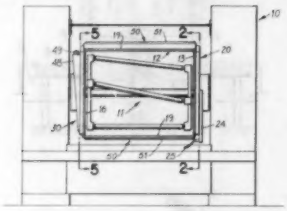


1. A thermally conductive surface for transferring heat to a boiling liquid in a heat exchange apparatus comprising at least one gapped cavity wherein vapor is trapped to promote nucleate boiling, said cavity being defined by a wall and spaced ridges affixed to the wall, the ridges having a base portion attached to the wall and two fins mounted to the base portion such that a fin from each ridge is angled over the cavity forming a narrow gap therebetween, said cavity being elliptical in configuration and having curvilinear surfaces throughout, such that from the portion of the cavity adjacent the wall portion of the surface the cavity increases in width to a point and thereafter decreases in width to a gap at the end of the cavity formed by the fins, said gap serving to allow limited flow of the heat transfer fluid into and out of the cavity.

4,159,740
DIRECT EXPANSION JACKET FOR HORIZONTAL DOUGH MIXERS

Samuel O. Seiling, Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,388
Int. Cl.[2] F28F 13/08, 3/12; F25B 17/00
U.S. Cl. 165—147 8 Claims



1. A multi-section direct expansion jacket provided on the main sheet and end walls of the mixing bowl of a dough mixer having an agitator in said bowl mounted for movement on a shaft extending through said end walls, comprising

an inlet jacket portion having an outer wall and wall means connected between said outer wall and one of said end walls defining a spiral flow path portion having inlet means at one end adapted to receive a flow of liquid coolant and an outlet at its other end,

said spiral flow path portion increasing in cross-sectional area from said inlet means to said outlet,

a second jacket portion having an outer wall and wall means connected between said outer wall and said main bowl sheet defining a repeatedly retroverted flow path portion with an inlet at one end in flow communication with the outlet of said spiral flow path portion and an outlet at its other end,

said retroverted flow path portion comprising a plurality of runs flow connected in series and extending transversely of said shaft of said agitator,

each of said runs having a greater cross-sectional area than the adjacent run nearer the inlet, and

an outlet jacket portion having an outer wall and wall means connected between said outer wall and the other of said end walls defining an arcuate flow path portion having an inlet at one end in flow communication with the outlet of said retroverted flow path portion and a discharge manifold at its other end, and

said arcuate flow path portion progressively increasing in cross-sectional area from said inlet thereof to said discharge manifold.

4,159,741
HEAT EXCHANGER

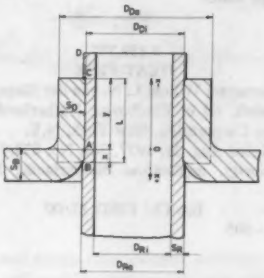
Manfred Nonnenmann, Schwieberdingen, and Helmut Bardong, Stuttgart, both of Fed. Rep. of Germany, assignors to Suddeutsche Kuhlerfabrik Julius Fr. Behr, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 518,146, Oct. 25, 1974, abandoned.
This application Jul. 28, 1976, Ser. No. 709,579
Int. Cl.[2] F28F 9/16
U.S. Cl. 165—173 8 Claims

1. In a heat exchanger having a thin-bottomed water compartment and a block of thin-walled finned tubes connected to the bottom of the water compartment, wherein the wall thickness of the bottom of the water compartment is less than 3.0mm and the wall thickness of the tubes is less than 1.5 mm, and wherein flange passages are provided in the bottom for the tubes, the improvement wherein the tubes are connected to the passages in the water compartment bottom by expansion alone without additional sealing means and wherein the dimensions and properties of the water compartment bottom and the tubes are selected such that the value of a first parameter K_1 is in the range between 1.2 and 8, where

$$K_1 = L \cdot (S_B/s_R) \cdot (\delta_B/\delta_R),$$

L = the length in mm of the surface of the tube in contact with the passage,



S_B = the wall thickness in mm of the water compartment bottom in the original condition thereof,

S_R = the wall thickness in mm of the tube prior to expansion,

ρ_B = the tensile strength of the material of the water compartment bottom in $K_p \cdot mm^{-2}$, and

ρ_R = the tensile strength of the tube material in $K_p \cdot mm^{-2}$.

4,159,742
WELL BORE CLEANING TOOL

Granison T. Alexander, Jr., New Orleans, La., assignor to Chromalloy American Corporation, St. Louis, Mo.

Filed Dec. 27, 1977, Ser. No. 864,326
Int. Cl.[2] E21B 37/02
U.S. Cl. 166—173 10 Claims

1. A well bore cleaning tool adapted for attachment to a casing pipe or the like which is to be run into said well bore, comprising:

a pair of cables;

means for attaching said cables to said pipe at a plurality of axially spaced apart points to form a double helix about said pipe, said helix including a plurality of segments outwardly bowed from said pipe, wherein said segments extend outwardly from said pipe to substantially completely contact the walls of said well bore during rotation and reciprocation of said pipe.

4,159,743

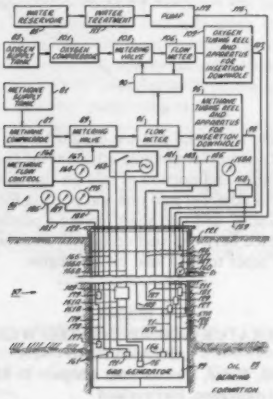
PROCESS AND SYSTEM FOR RECOVERING HYDROCARBONS FROM UNDERGROUND FORMATIONS

Leslie C. Rose, Rocky Mount, and Joseph T. Hamrick, Roanoke, both of Va., assignors to World Energy Systems, Fort Worth, Tex.

Continuation-in-part of Ser. No. 756,129, Jan. 3, 1977, Pat. No. 4,078,613, which is a continuation of Ser. No. 602,680, Aug. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 534,778, Dec. 20, 1974, Pat. No. 3,982,591. This application Mar. 13, 1978, Ser. No. 886,104

Int. Cl.[2] E21B *43/24, 47/06*

U.S. Cl. 166—302 2 Claims



1. In a recovery process for recovering hydrocarbons or other fluids from underground formations penetrated by a borehole and wherein a gas generator is located in the borehole at or near the level of said formations, said gas generator comprising:

a housing forming a chamber with a combustion zone at one end, a restricted outlet at an opposite end, a second zone located downstream of said combustion zone, and a gas and water mixing zone located between said second zone and said restricted outlet,

the method of operating said gas generator comprising the steps of:

flowing through said borehole from the surface to said gas generator, by way of separate passages, hydrogen and oxygen,

injecting said hydrogen and oxygen into said combustion zone to form a combustible mixture of gases,

igniting and burning said combustible mixture in said combustion zone,

injecting an additional supply of oxygen into said second zone to burn additional hydrogen from said first zone while supplying water into said second zone to maintain the temperature below a predetermined maximum value, and

flowing water into said gas and water mixing zone for the formation of steam whereby hot gases and steam are injected from said restricted outlet for flow into said formations.

2. A system including a gas generator for generating in a borehole, hot gases and steam, for recovering hydrocarbons and other fluids from underground formations penetrated by the borehole, comprising:

a gas generator located in the borehole at or near the level of said formations,

said gas generator comprising:

a housing forming a chamber and having a combustion zone at one end, a restricted outlet at an opposite end, a second zone located downstream of said combustion zone, and a gas and water mixing zone located between said second zone and said restricted outlet,

first conduit means coupled to said one end of said chamber for injecting hydrogen into said combustion zone,

second conduit means coupled to said one end of said chamber for injecting oxygen into said combustion zone for forming a combustible mixture of gases therein for ignition,

third conduit means for injecting an additional supply of oxygen into said second zone of said chamber for burning additional hydrogen from said combustion zone,

means for injecting water into said second zone for maintaining the temperature below a predetermined value,

hydrogen supply means, including conduit means, extending from the surface for supplying hydrogen to said first conduit means,

oxygen supply means, including conduit means, extending from the surface of supplying oxygen to said second and third conduit means,

means including conduit means, for supplying water for injection into said gas and water mixing zone for the formation of steam whereby hot gases and steam are injected from said restricted outlet into the formations.

4,159,744

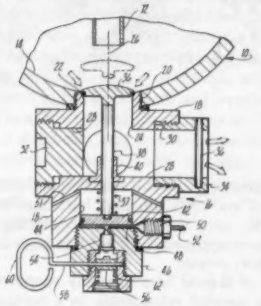
FIRE EXTINGUISHANT MECHANISM

Anthony J. Monte, 47600 Bluebird, Utica, Mich. 48087, and Ernest C. Wahoski, 20489 Lancaster, Harper Woods, Mich. 48225

Filed Dec. 9, 1977, Ser. No. 858,925

Int. Cl.[2] A62C *35/12, 37/06, 37/18*

U.S. Cl. 169—26 9 Claims



1. Fire-extinguisher mechanism comprising an upright thick-walled bottle containing pressurized fire-extinguishant; an extinguishant dicharge valve body mounted on the lower end of the bottle; the extreme upper end of said valve body defining a valve seat facing the bottle interior, said valve seat being located in the plane of the bottle bottom wall in direct fluid communication with the bottle interior whereby pressurized suppressant on the bottle bottom wall is enabled to reach the valve seat by radial inflow toward the valve seat axis, a first passage extending from the valve seat downwardly along the bottle axis, and at least one other discharge passage extending from the first passage approximately normal to the bottle axis; a valve poppet seatable on the aforementioned valve seat for normally preventing flow out of the bottle; said valve body including wall structure that forms a valve actuation chamber directly below the first passage; a valve-actuator piston slidably arranged in said chamber for upward advancement along the bottle axis toward the valve seat; and a stem rigidly connecting the piston and valve poppet, whereby upward advancement of the piston within the chamber causes the valve poppet to move upwardly away from the valve seat into the bottle interior thereby enabling pressurized extinguishant to

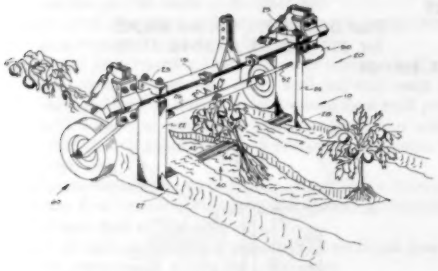
flow downwardly from the bottle through the aforementioned passages; an explosive squib (**50**) mounted on the valve body in fluid communication with the chamber space below the piston, said squib being capable of generating a sufficiently high gaseous pressure on the lower face of the piston to produce rapid upward advancement of said piston within the actuation chamber; and means for filling and pressurizing the bottle comprising a fitting (**64**) mounted on the upper end of the bottle to define a central chamber (**68**) on the bottle axis, a check valve mounted on the fitting for admittng fluid to the central chamber (**68**), and a filler tube extending from the fitting downwardly into the bottle for transporting fluid from the central chamber (**68**) to a point in the bottle adjacent the aforementioned poppet valve; said filler tube constituting a mechanism for supplying a pressurizing agent to the lower portion of the bottle whereby said agent is allowed to bubble upwardly through the liquid extinguishant before pressurizing the space above the liquid surface.

4,159,745

CROP UPROOTING AND SOIL WORKING APPARATUS

Clarence E. Hood; Byron K. Webb, both of Clemson, S.C., and Yekutiel Alper, Bet Dagan, Israel, assignors to Clemson University, Clemson, S.C.

Filed Dec. 9, 1977, Ser. No. 859,227
Int. Cl.[2] A01B *39/12, 39/19*
U.S. Cl. 172—44 **12 Claims**



9. Crop uprooting and soil working apparatus comprising:
(a) a pair of vertically oriented, horizontally spaced support standards, with each standard including means located adjacent an upper edge of said standards for attachment to a transport means;
(b) a pair of shaped bars rotatably supported by said standards in parallel relationship in a horizontal plane, said bars having angled edges thereon, and being located proximate each other to permit angled edges of same to sever foliage passing therebetween; and
(c) drive means for said bars supported on said standards for syncronally rotating said bars whereby advancement of said bars beneath the surface of a crop bed will effect an uprooting of plants grown on said bed, and severing of foliage between said bars will preclude foliage build up around said bars.

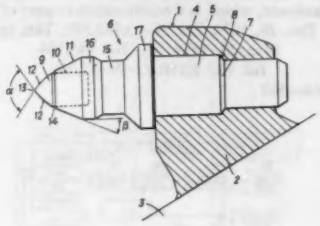
4,159,746

BIT OF CIRCULAR CROSS-SECTION

Herwig Wrulich, Zeltweg; Karlheinz Gehring, Trofaiach, and Alfred Zitz, Zeltweg, all of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Apr. 13, 1977, Ser. No. 787,221
Claims priority, application Austria, Apr. 14, 1976, 2750/76
Int. Cl.[2] E21B *9/08*
U.S. Cl. 175—354 **7 Claims**

1. A cutting bit comprising a bit shaft of circular cross-section having one end portion adapted to be inserted into a bore in a bit holder and carrying in a bore in its other end the inner end of a hard bit tip made of carbide metal, said bit tip having a tapered outer end portion which is of circular cross-section coaxial with the bit shaft and which has the shape of a body of revolution with convex generatrices, the portion of said shaft adjacent said bit tip tapering toward said bit tip and having the shape of a truncated cone with straight generatrices, the angle of the truncated conical portion being approximately equal to



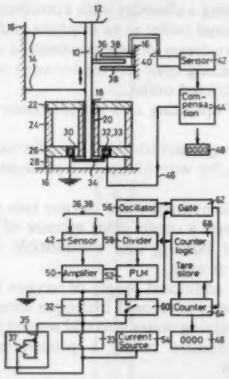
the angle of the outer end portion of said bit tip, and the truncated conical portion terminating adjacent the beginning of the taper of the outer end portion of said bit tip, said shaft having a collar portion adjacent said one end portion for covering the bore in the holder, and said shaft having a portion of reduced diameter located between said collar portion and the location at which the taper toward said bit tip begins.

4,159,747

TEMPERATURE-COMPENSATED WEIGHING APPARATUS

Enrico Realini, Uster, Switzerland, assignor to Mettler Instrument AG, Greifensee, Switzerland

Filed May 1, 1978, Ser. No. 901,986
Claims priority, application Switzerland, Jun. 29, 1977, 8013/77
Int. Cl.[2] G01G *7/02*
U.S. Cl. 177—210 EM **6 Claims**



1. In a weighing system of the electromagnetic compensation type including load support means for supporting a load for movement from a normal first position relative to a stationary frame; sensing means for generating a signal that is a function of the extent of displacement of said load support means by the load from said first position; permanent magnet means connected with said frame to define an air gap relative to said load supporting means; compensation coil means including first and second compensation coils connected with said load support means and arranged within said air gap; compensating current supply means operable by said sensing means for supplying compensating current to said compensation coil means,

said compensating current supply means including a source of compensating current, said second compensation coil being connected in series between said compensating current source and said first compensation coil, means including a switch connected in parallel across said first compensation coil for dividing the compensating current into a continuous first current portion which generally corresponds with the preloading effect of said load support means, and a second portion that is periodically supplied to said first coil means for periods of time that are a function of the magnitude of the load applied to said load support means; control means operable by said sensing means for operating said switch as a function of the position of said load support means relative to said frame; and indicating means for indicating the magnitude of the load as a function of the compensating current required to restore the load supporting means to the first position, said indicating means being responsive only to said second compensating current portion, whereby said indicating means affords an indication of the load being weighed substantially independently of the no-load preloading effect of said load supporting means;

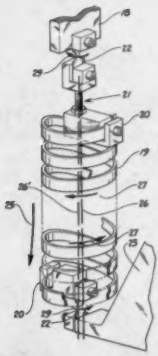
the improvement which comprises temperature compensation means for varying the preloading effect to compensate for changes in temperature of said weighing system, said temperature compensation means including impedance means connected in parallel with said second coil, said impedance means being physically spaced in non-heat conducting relation relative to said second coil.

4,159,748

WEIGHING SCALE

Frederick J. Staudinger, North Salem, N.Y., and Paul M. Kasarauskas, Stamford, Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 12, 1977, Ser. No. 859,864
Int. Cl.[2] G01G *3/02*
U.S. Cl. 177—225 **4 Claims**



1. A suspension apparatus for a Weighing scale, comprising:

a movable load support that deflects in response to a load being weighed;

a coil spring for supporting said load support for deflection through a given weighing range;

a frame for carrying said coil spring; and

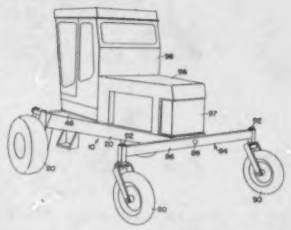
a pair of spring hangers, one hanger of said pair connecting said spring to said frame, and the other hanger of said pair connecting said spring to said load support, each hanger of said pair comprising a flexure pivot consisting of a torsion-free member whose ends are fixedly restrained, whereby as said load support deflects in response to said load, said coil spring is free to uncoil such that the load support will obtain a linear deflection characteristic with respect to the load being weighed.

4,159,749

HARVESTING MACHINE FRAME

Sidney J. Boushek, Jr., Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 28, 1977, Ser. No. 846,377
Int. Cl.[2] B62D *21/00*; A01D *67/00*
U.S. Cl. 180—305 **10 Claims**



9. An improved frame for a self-propelled machine comprising:

a horizontal transverse front beam having opposite ends;

a pair of opposite generally horizontal side beams having their forward ends respectively attached to the opposite ends of the front beam and converging rearwardly therefrom:

means connecting the rearward ends of the side beams to form a generally triangular horizontal subframe in the form of a regular trapezoid;

a castering rear wheel means supporting the rearward end of the subframe;

a pair of front wheel support housings respectively directly attached to and extending downwardly from the opposite ends of the front beam and the forward portions of the adjacent side beams, each support housing including an outer side wall, an upper portion of the side wall abutting and being welded to the front beam and overlapping and being welded to a forward portion of the outer lateral side of the adjacent side beam, and an inner generally vertical side wall opposite the outer side wall, the upper end of the inner wall abutting and being welded to the under side of the front beam;

and a pair of forward drive wheel means respectively supported on the lower ends of the wheel support housings.

4,159,750

ADAPTER FOR PRELOADING BEARINGS

Robert E. Brown, East Peoria; David L. Johnson, and John F. Lindquist, both of Morton, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 4, 1977, Ser. No. 848,634
Int. Cl.[2] B62D *55/12*
U.S. Cl. 180—9.62 **7 Claims**

1. An adapter for use in preloading bearings in the final drive of a crawler-type vehicle, comprising:

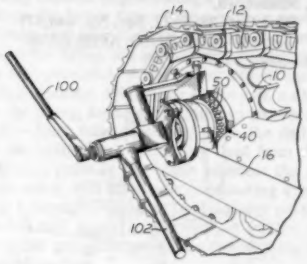
a plate having opposite sides and adapted to be mounted concentrically with the sprocket shaft of a final drive;

means associated with said plate for securing the plate in concentric relation to the sprocket shaft;

a stub shaft extending from one side of said plate;

an arm rotatably mounted on said stub shaft and having a radial part extending beyond the periphery of the plate and an axial part terminating in an end on the side of the plate opposite said one side;

A jaw mounted on said end and adapted to engage a bearing adjusting nut on the final drive; and



means on said arm for receiving a rotative force from a torque wrench or the like generally concentrically with said stub shaft.

4,159,751

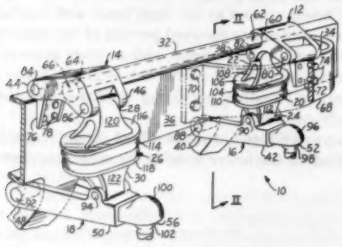
SUSPENSION SYSTEM FOR TANDEM AXLE VEHICLES

James A. Garman, Eureka, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 15, 1977, Ser. No. 787,817

Int. Cl.[2] B62A *61/10*

U.S. Cl. 180—22 **5 Claims**



1. A tandem axle vehicle suspension system, comprising:

first and second torque arms each having a first end pivotally connected to a frame portion of an associated tandem axle vehicle;

first and second suspension arms each having a first end pivotally connected to the frame;

a first resilient suspension member having a torque end pivotally connected to a second end of the first torque arm and having a suspension end pivotally connected to a second end of the first suspension arm, the second end of the first suspension arm being ball and socket connected to a first wheel of the associated vehicle;

a second resilient suspension member having a torque end pivotally connected to a second end of the second torque arm and having a suspension end pivotally connected to a second end of the second suspension arm, the second end of the second suspension arm being ball and socket connected to a second wheel of the vehicle; and

a torsion equalizer member fixedly connected to each of the first and second torque arm members.

4,159,752

TRICYCLE

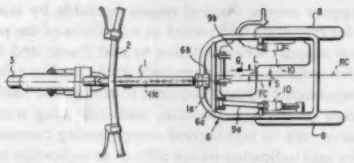
Nobuyuki Kanno, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Oct. 13, 1977, Ser. No. 841,754

Claims priority, application Japan, Oct. 14, 1976, 51-137019[U]; May 28, 1977, 52-69262[U]

Int. Cl.[2] B60G *9/02, 11/18*

U.S. Cl. 180—210 **5 Claims**



1. A tricycle comprising:

a rear frame having provided thereon two rear wheels and having a central longitudinal axis;

a front frame rotatably and resiliently coupled to said rear frame at a single point such that a longitudinal axis of said front frame is offset to one side of said central longitudinal axis of said rear frame;

a seat coupled to said front frame;

and a motor coupled to said rear frame and driving said rear wheels, said motor further being coupled to said rear frame such that a center of gravity of said motor is offset to another side of said tricycle relative to said central longitudinal axis of said rear frame whereby the stability of the tricycle is increased.

4,159,753

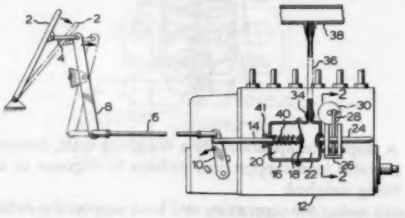
CRUISE CONTROL DEVICE FOR VEHICLES

Paul H. Boche, 210 Waneta Dr., Oakville, Ontario, Canada

Filed Sep. 2, 1977, Ser. No. 830,071

Int. Cl.[2] B60K *31/00*

U.S. Cl. 180—177 **5 Claims**

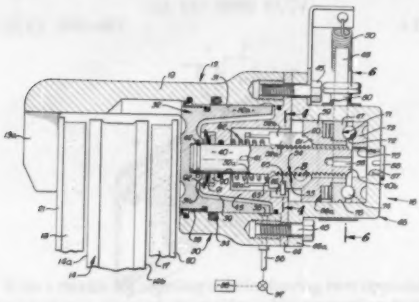


1. A speed control device for an internal combustion engine comprising a movable actuator member for connection to and conjoint movement with an accelerator linkage of the engine, a normally freely movable abutment member, a clamp device operable to clamp the abutment member in any of a range of positions, and a resilient connection established between the actuator member and the abutment member through a vacuum actuator in pneumatic connection with an inlet manifold of the engine.

4,159,754
PARKING BRAKE ASSEMBLY

Franklin B. Airheart, Sylmar, and Emilio L. Agarpao, Northridge, both of Calif., assignors to Airheart Products, Inc., Chatsworth, Calif.

Filed Dec. 5, 1977, Ser. No. 857,385
Int. Cl.² F16D 65/52
U.S. Cl. 188—71.8 **15 Claims**



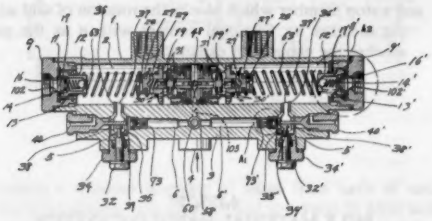
1. In a brake assembly, the combination comprising
(a) a carrier having a bore, and a piston slidable axially in the bore to transmit force of fluid pressure acting on the piston to a brake pad,
(b) a shaft having an axis extending axially to transmit auxiliary thrust to the piston,
(c) a rotary actuator member rotatable about said axis, and
(d) coupling means responsive to rotation of said member in one direction to effect axial advancement of the shaft toward the piston accompanied by gripping of the shaft, and responsive to rotation of said member in the opposite direction to allow retraction of the shaft, said coupling means including a collet having spring fingers spaced about the shaft, the collet and shaft having mutually engageable elements to effect said axial advancement of the shaft in response to radially inward displacement of said spring fingers, said shaft element comprising a screw thread,
(e) the rotary actuator member extending about the shaft axis and having a central opening extending axially therethrough, the shaft being in alignment with said central opening and having an end portion remote from the piston and to which access may be had for adjustably rotating the shaft relative to the collet, the shaft also having an end portion proximate the piston and rotatably coupled thereto to allow shaft rotation relative to the piston.

4,159,755
SAFETY HYDRAULIC BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES

Byung K. Kang, 379-2, Jungneun-dong, Sungbook-ku, Seoul; Jin C. So, 151-3, Choonglim-dong, Choong-ku, Seoul; Tae H. Chung, 132-74, 1-ka, Do-dong, Yongsan-ku, Seoul, and Won Choi, 167-77, Chunho-dong, Gangnam-ku, Seoul, all of D.P.R. of Korea

Filed Nov. 30, 1977, Ser. No. 855,999
Int. Cl.² B60T 11/32
U.S. Cl. 188—151 A **7 Claims**

1. A safety hydraulic brake system for automotive vehicles having at least one set of front wheels and one set of rear wheels and brake cylinders at each wheel, a control cylinder having a first outlet communicated with brake cylinders at said front wheels and a second outlet communicated with brake cylinders at said rear wheels, said control cylinder having an inlet communicated with hydraulic pressure developing means, said control cylinder including bore means communicated with said first and second outlets, first and second piston means in said bore means, first and second valve means in said bore means and operable to permit pressurization of said front and rear wheel brake cylinders upon actuation of said hydraulic pressure developing means, said first and second piston means being operable to effect closing of said first or second valve means upon actuation of said hydraulic pressure developing means and upon loss of pressure at said front or rear wheel cylinders, respectively, whereby to prevent loss of pressure at the other of said front and rear wheel cylinders,

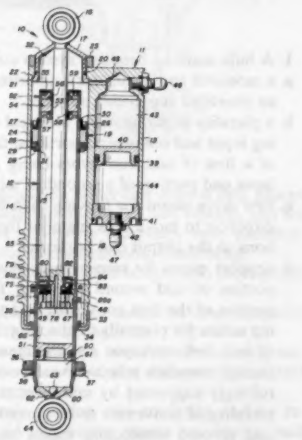


said first and second piston means each including a bypass valve means operable to permit hydraulic fluid to pass said piston means, said bypass valve means closing upon initial pressurization of said front and rear wheel brake cylinders, and upon fluid pressure release, said bypass valve means shifts initially to an open position and then to another closed position while said first and second valve means shift to a closed position.

4,159,756
ADJUSTING DEVICE FOR DAMPING FORCE OF REAR SHOCK-ABSORBERS OF MOTORCYCLES

Tomoharu Murakami, Kagamihara, and Tadashi Jo, Kani, both of Japan, assignors to Kayaba K.K., Tokyo, Japan

Filed Jan. 17, 1978, Ser. No. 870,193
Int. Cl.² F16F 9/44
U.S. Cl. 188—319 **3 Claims**



1. A damping force adjusting device for use in the rear shock-absorber of motorcycles, comprising
a damper cylinder;
a piston rod inserted from the outside and penetrating through an end member of said damper cylinder;
a piston fixed to a lower end of said piston rod to separate said damper cylinder into upper and lower working chambers;
a valve installed in the piston to determine the damping force in the medium and high speed range of the piston by

providing resistance to the working fluid flowing throughout said upper and lower working chambers;

a passage in the piston rod to connect the upper and lower working chambers in parallel to a flow passage of the working fluid through the valve;

an adjusting member having a plurality of orifices, different in diameter, which are selectively connected to a port opening into the upper working chamber of said passage;

said adjusting member being fitted rotationally to the piston rod;

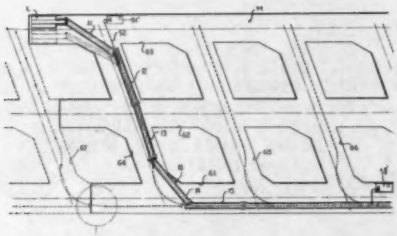
and a stop member which blocks the rotation of said adjusting member by frictional contact with it as the piston reaches the extreme of expansion.

4,159,757

BULK MATERIAL HANDLING SYSTEM

William K. Kleysteuber, Wexford, and William D. Mayercheck, New Stanton, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 4, 1977, Ser. No. 793,664
Int. Cl.[2] B65G *65/02, 41/02*
U.S. Cl. 198—303 **15 Claims**



1. A bulk material handling system comprising:

a. a monorail and means for supporting said monorail from an overhead supporting surface;

b. a plurality of substantially identical conveyors, each having input and output end portions, the output end portion of a first of said conveyors being positioned above the input end portion of a second of said conveyors;

c. first drive means for moving each of said conveyors in a direction to move bulk material from the input end portions to the output end portions;

d. support means for suspendingly supporting the input end portion of said second conveyor from said output end portion of the first conveyor, said support means including means for pivotally connecting the output end portion of said first conveyor and the input end portion of said second conveyor relative to each other, and trolley means rollingly supported by said monorail for permitting said plurality of conveyors to be moved along said monorail, said pivoted connecting means and said trolley means being connected and aligned to permit said first and second conveyors to be moved between in-line and out-of-line position about an axis generally normal to said monorail so that the center-to-center alignment is maintained between said first and second conveyors relative to the bulk material passing therebetween; and

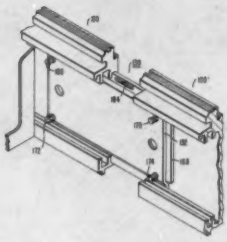
e. cable means for coupling said trolleys of said plurality of conveyors, and second drive means for pulling said cable means to move said plurality of conveyors along said monorail.

4,159,758

TRANSPORTATION APPARATUS

Iber C. Courson, Gettysburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 19, 1977, Ser. No. 834,365
Int. Cl.[2] B66B *9/14*
U.S. Cl. 198—335 **5 Claims**



1. Transportation apparatus for transporting persons between spaced landings, comprising:

a supporting structure,

a conveyor mounted on said supporting structure, said conveyor having an upper load bearing run and a lower return run,

first and second skirts mounted in spaced relation on said supporting structure, on opposite sides of said conveyor, to form substantially vertical walls adjacent to the load bearing run,

each of said skirts including a plurality of skirt sections disposed in end-to-end relation,

each of said skirt sections having a wall portion and first and second members spaced from a common side of said wall portion which define upper and lower slots, respectively, the openings of which face one another,

and expandable splice means disposed to interconnect at least first and second adjacent skirt sections,

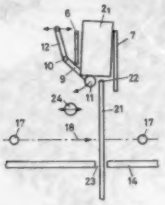
said expandable splice means including a plate member having upper and lower edges disposed in the upper and lower slots, respectively, of said adjacent skirt sections, and adjustable pressure means in contact with said plate member and the common side of the wall portions of said adjacent skirt sections, said adjustable pressure means providing forces which tend to separate the plate member from said wall portions, to laterally align said adjacent skirt sections and lock them in end-to-end relation,

said plate member including first and second openings therein disposed adjacent to a selected one of the upper and lower edges, with the portions of the plate member located between each opening and the adjacent edge being bent outwardly away from the associated openings, said first and second openings being spaced from one another such that the bent edges associated with the first and second openings contact the bottoms of the associated slots in the first and second adjacent skirt sections, respectively, to force the opposite edge of the plate member against the bottom of its associated slots in the first and second adjacent skirt sections, to vertically align the first and second adjacent skirt sections.

4,159,759
DEVICE FOR TOPPLING ARTICLES DURING CONVEYANCE

Odo Nimmrichter, Gallingen, Fed. Rep. of Germany, assignor to S I G Schweizerische Industrie-Gesellschaft, Rheinfall, Switzerland

Filed Dec. 2, 1977, Ser. No. 857,178
Claims priority, application Switzerland, Dec. 7, 1976, 15383/76
Int. Cl.[2] B65G 47/24
U.S. Cl. 198—407 4 Claims



1. In a device for toppling articles having two opposed long sides and two opposed short sides while conveying such articles, which device includes means defining a discharge path provided with carrier elements extending perpendicular to both the long sides and the short sides of the article for moving the articles after toppling in a discharge direction extending perpendicular to both the long sides and the short sides of the articles, the improvement comprising means defining at least two input paths above said discharge path for conveying such articles in an input direction transverse to the discharge direction, with the long and short sides of each article perpendicular to the input direction and the long sides of each article vertical; and a plurality of lowering and toppling mechanisms, each associated with a respective input path and disposed for transferring articles from its associated input path to said discharge path while lowering and toppling the articles, each said mechanism including a supporting element movable between a position for supporting articles received from the associated input path and a release position for permitting such articles to drop, a pickup element for supporting and lowering such articles when said supporting element is moved to its release position, and a toppling element movable from a starting position for toppling such articles onto said discharge path upon lowering of such articles by said pickup element, so that the short sides of each such article are vertical on said discharge path; said supporting element being a supporting rod mounted for pivotal movement into the release position, said pickup element being a pickup plate presenting an upper edge on which the articles are supported during lowering, and said toppling element being a toppling rod which extends transversely to said discharge path and arranged for moving articles which have been lowered almost down to said discharge path at a speed which exceeds the speed of said carrier elements until the articles topple over in the discharge direction.

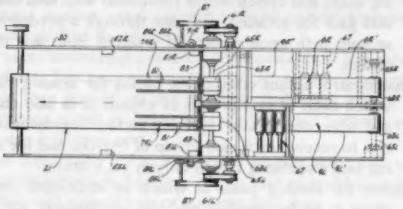
4,159,760
METHOD OF AND APPARATUS FOR FEEDING RANDOMLY RECEIVED ITEMS

Lloyd Kovacs, and Charles G. Hart, Sheboygan, Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Apr. 13, 1977, Ser. No. 787,061
Int. Cl.[2] B65G 47/31
U.S. Cl. 198—419 27 Claims

1. The method of feeding items to apparatus, such as a flight conveyor, which cycles continuously at a steady cycling rate with a predetermined grouping of items being placed on the apparatus during a portion of each cycle thereof, said cycle portion being referred to as a window and the latter having a leading and a trailing boundary, said items being randomly received from a plurality of sources, the method comprising the steps of:

accumulating, for each source, a backlog of items randomly received from that source, the items in each backlog being in substantially end-to-end abutting relationship one with another;



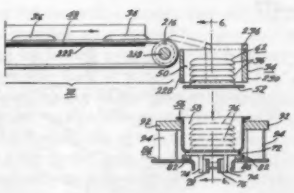
releasing a selected plurality of items from each of said backlogs during each cycle of said apparatus to form said grouping, the items so released from each backlog remaining in substantially end-to-end abutting relationship one with another; and

conveying forward said grouping in timed relation to said apparatus and placing said grouping in a respective window of said apparatus.

4,159,761
COOKIE DISPENSING APPARATUS

Walter W. Egee, Wallingford, Pa., and Clarence W. Cramer, Burlington, N.J., assignors to Campbell Soup Company, Camden, N.J.

Division of Ser. No. 764,190, Jan. 31, 1977, Pat. No. 4,085,563.
This application Nov. 14, 1977, Ser. No. 851,068
Int. Cl.[2] B65G 47/26, 57/00
U.S. Cl. 198—422 4 Claims



1. Apparatus for segregating wafer-like objects into groups each containing a preselected number of said objects, and for dispensing said groups of objects separately onto predetermined different receiving surface regions, comprising:

a storage chamber for receiving and temporarily storing said groups of objects;

controllably actuatable dispensing means for dispensing said groups of objects from said chamber;

object-receiving means having a plurality of receiving surface regions upon each of which a different one of said groups is to be dispensed;

means for successively moving said receiving surface regions adjacent said dispensing means to receive said groups of objects on said receiving surface regions, upon sequential appropriately-timed actuations of said dispensing means;

delivery-line means for receiving a generally horizontal edge-supported face-abutting array of said wafer-like objects and for delivering said objects sequentially into said chamber to form said groups of objects; and

control means for controlling said dispensing means to effect said dispensing of said groups of objects from said chamber onto said surface regions;

said controllably actuatable dispensing means comprising a

rotatable gate forming the bottom of said storage chamber, and gate actuating means for rotating said gate upon signal from said control means to temporarily open the bottom of said storage chamber to permit discharge of said groups of objects;

said gate actuating means comprising a continuously rotating shaft, and clutch means connected with said shaft and said gate for rotating said gate through a predetermined arcuate path upon receipt of a signal from said control means;

said control means comprising means for sensing times at which each of said groups of objects is in said chamber and when one of said receiving surface regions is in position to receive each said group of objects, and for actuating said dispensing means only at such times;

means for sensing times at which an additional object is about to be delivered to said storage chamber while said chamber contains a group of said selected number of said objects, and means for delaying the delivery of said additional object so that it is not delivered to said chamber until after the group of objects in said chamber has been dispensed;

wherein said means for delaying operation of said delivery-line means comprises means for stopping said delivery-line means when said additional object is about to be delivered to said chamber, thereby to prevent said delivery of said additional object until after said predetermined number of said objects have been dispensed.

4,159,762

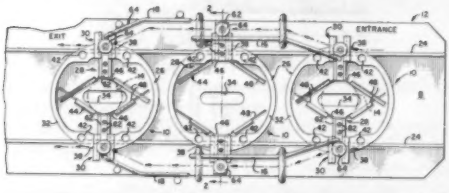
ARTICLE TRANSFERRING APPARATUS

Joseph P. Bulwith, Wayne, N.J., assignor to Avon Products, Inc., Suffern, N.Y.

Continuation of Ser. No. 722,124, Sep. 10, 1976, abandoned. This application Jan. 12, 1978, Ser. No. 868,917

Int. Cl.[2] B65G *37/00*

U.S. Cl. 198—472 **12 Claims**



1. A transfer apparatus which comprises in combination,

(a) housing means defined by a cylindrical shell-type walled member having a bottom;

(b) gripping means disposed within the housing means and having an opposed pair of interfitting gripping members each of which is fixedly connected to oppositely disposed actuating means for movement between gripping and non-gripping positions;

(c) a plurality of retaining bores disposed in said housing to removably receive driving projections of a transfer mechanism;

(d) said actuating means having sliding means and contacting means, said sliding means disposed within a guide housing and supporting a cam follower; and

(e) said contacting means having an adjusting member to control the amount of frictional forces to be exerted on the guide housing to inhibit movement of the sliding means;

(f) whereby movement of the cam follower causes the sliding means of the actuating means to move the interfitting gripping members between gripping and non-gripping positions.

4,159,763

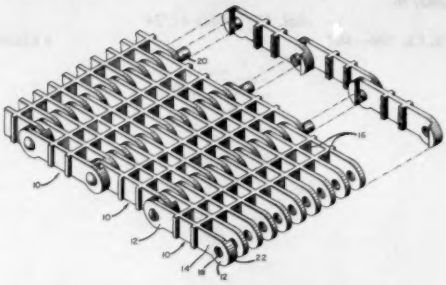
INSPECTABLE MODULAR CONVEYOR

Monte L. Kewley, New Orleans, and LeRoy E. Demarest, Kenner, both of La., assignors to The Laitram Corporation, New Orleans, La.

Filed Aug. 2, 1977, Ser. No. 821,136

Int. Cl.[2] B65G *17/06*

U.S. Cl. 198—853 **8 Claims**



1. A conveyor belt comprising in combination:

a plurality of like modules, each of said modules including a first plurality of link ends of like width, a second plurality of link ends each of said like width, and an intermediate section integrally formed with and joining said first and second plurality of link ends;

said link ends of each said modules being releasably engaged between link ends of an adjacent module except for individual link ends disposed at the extreme sides of said module;

a pivot rod for pivotally connecting said modules at engaged link ends;

said link ends of each of said modules being of a width substantially less than the spacing between confronting link ends along the pivotal axes thereof to provide a substantial space between confronting link ends thereby to expose for inspection and cleaning a substantial portion of the pivot rod connecting adjacent modules;

said modules being arranged in staggered relation with a side edge of each module being disposed intermediate the side edges of an adjacent pivotally connected module;

a spacer means positioned between at least one pair of confronting link ends along each pivot rod, said spacer means extending along the direction of the pivotal axis and in engagement with the confronting surfaces of said pair of link ends, thereby to maintain the spaced confronting relation between the other connected link ends for exposure of the interconnecting pivot rod; and

the link ends associated with said spacers being resilient to permit lateral movement of a module relative to an adjacent connected module along the pivotal axis to expose normally concealed portions of the interconnecting pivot rod.

4,159,764

PLASTIC PACKING CONTAINER

Friedel Schinke, Hämelingerstrasse 11, 4900 Herford, Fed. Rep. of Germany

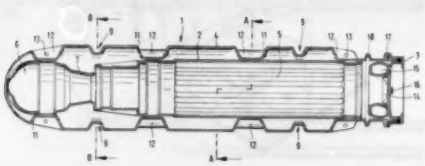
Filed Apr. 25, 1978, Ser. No. 899,730

Int. Cl.[2] F42B *37/00, 39/00*

U.S. Cl. 206—3 **12 Claims**

1. A plastic packing container for individually packing goods susceptible to shock, the packing container comprising an inner container and an outer container, said outer container being provided with closure means, said inner container being adapted to the outer shape of the goods to be packed, said inner and said outer container comprising an elastically deformable

plastic material, said outer container having a sustantially larger diameter than the outer diameter of the inner container and having corrugations forming wall portions to support the inner container such that said inner container is essentially surrounded by cavities formed by wall portions of said inner



container and said outer container, so that a local support in only restricted areas is formed between said inner container and said outer container whereby the forces generated upon impact or fall are absorbed by an elastic deformation of the walls defining said cavities.

4,159,765

DISPLAY CARTON

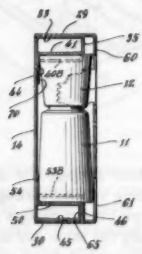
Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Mar. 29, 1978, Ser. No. 891,069

The portion of the term of this patent subsequent to Jul. 26, 1994, has been disclaimed.

Int. Cl.[2] B65D *5/50*

U.S. Cl. 206—45.19 **7 Claims**



1. A blank made of paperboard and adapted to be folded into a display carton of generally rectangular and tubular shape, comprising:

a substantially rectangular sheet of said paperboard, said sheet having opposed vertical lateral edges and opposed horizontal top and bottom edges;

four vertically spaced parallel hinge lines intermediate the lateral edges thereof defining a pair of side walls, a front panel, a back panel, and a manufacturer's glue flap positioned at one lateral edge thereof;

said side walls and said front panel having end closure flaps hingedly attached to the top and bottom edges thereof along said top and bottom horizontal edges;

said front panel having means for displaying the contents of the carton;

said back panel having a first rectangular flap hingedly attached along the bottom edge thereof;

said first flap having a bottom cushioning structure hingedly attached thereto along a horizontal fold line and a rectangular reinforcement panel cut therein along a score line whose ends terminate at said horizontal fold line;

said bottom cushioning structure having a pair of elongated apertures formed therein aligned substantially perpendicular to said bottom edge of said back panel, each of said apertures having spaced apart inner and outer lateral edges;

said structure including a second flap hingedly connected along a horizontal fold line to said first flap and defined on the opposite side by a first intermediate fold line extending between the ends of said elongated apertures as well as a first pair of colinear fold lines spaced between the lateral edges of said structures and said outer lateral edges of said apertures;

said inner lateral edges of said apertures and said first intermediate fold line together with a second intermediate fold line spaced from said first intermediate fold line defining a center support panel adapted to have said reinforcement panel abutted therebeneath;

said outer lateral edges of said apertures and said first pair of colinear fold lines together with a second pair of colinear fold lines parallel to said first pair defining a pair of restraining panels on either lateral side of said bottom cushioning structure; and

a glue flap connected to said center section along said second intermediate fold line and to said restraining panels along said second pair of colinear fold lines.

4,159,766

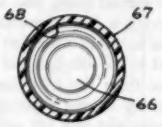
COVER FOR TEMPERATURE SENSING PROBE

Douglas J. Kluge, Minneapolis, Minn., assignor to Diatek, Inc., San Diego, Calif.

Continuation of Ser. No. 737,913, Nov. 1, 1976, abandoned, which is a division of Ser. No. 662,587, Mar. 1, 1976, Pat. No. 4,054,057. This application Nov. 30, 1977, Ser. No. 856,169

Int. Cl.[2] B65D *85/20*

U.S. Cl. 206—306 **10 Claims**



1. A cover for use with a temperature sensing probe having an elongated member, a tip secured to one end of the elongated member, said tip having a forwardly converging annular and relatively thin side wall,

said side wall having an outward convex shape, a temperature responsive element secured to the tip, means having a head surrounding the elongated member for holding the cover on the probe, said head having means cooperating with the cover to releasably latch the cover to the probe comprising: a tubular body having a generally cylindrical elastic side wall forming a chamber for accommodating part of the elongated member, and an end member secured to the body for accomodating the tip, said elastic side wall having an open end section having means engageable with the means on the head to releasably hold the cover in assembled relation with the elongated member and tip, said end member having a closed end and a forwardly converging annular relatively thin thermal window section adjacent the closed end, said closed end having a thickness greater than said window section, said window section having a flexible annular wall dimensioned to be deformed into closely fitting surface engagement with the convex shaped side wall of the probe tip when inserted therein whereby heat from the environment around the thermal window section is preferentially transferred through said thin thermal window section to the tip and the temperature responsive element secured thereto, said elastic side wall being operable to bias the flexible annular wall into surface engagement with the convex shaped side wall of the tip, and wherein the dimensioning of said closed end including the said thickness thereof precludes significant heat transfer therethrough as compared to said annular thermal window section.

4,159,767

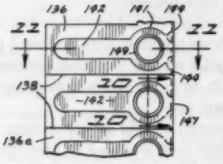
FOLDER-TANG ASSEMBLY APPARATUS

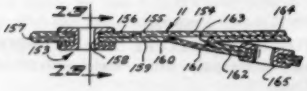
Philip O. Jesme, South St. Paul, and John A. Calkins, Hastings, both of Minn., assignors to The Smead Manufacturing Company, Hastings, Minn.

Filed Jul. 7, 1977, Ser. No. 813,653

Int. Cl.[2] B65D *85/54, 27/26*

U.S. Cl. 206—343 **11 Claims**





1. A transversely elongated web for having tangs mechanically punched therefrom and cinched to a file folder, comprising a transversely elongated first transverse leg having a first edge and an opposite second edge, and a transversely elongated second leg having a first transverse edge integrally joined along a fold line to the first leg first edge, and a second edge generally parallel to the fole line and substantially longitudinally more remote from the fold line than the first leg second edge, the first leg having a plurality of transversely spaced first ring portions and first tab portions extending between the fold line and the first ring portions, and longitudinally elongated first prongs having first edges integrally joined to the first ring portions opposite the first tab portions, and first tang border portions at least partially surrounding the first ring portions, the second leg having a plurality of transversely spaced, longitudinally elongated second prongs having first edges, second ring portions integrally joined to the second prongs first edges, second tab portions integrally joined to the second ring portions opposite the second prongs, and second tang border portions at least partially surrounding the second prongs and second ring portions, the first tab portions being integrally joined to the second tab portions at the fold line, each ring portion having a central opening therethrough, and cinchable flange integrally joined to one ring portion adjacent the edge thereof defining its central opening and relatively narrow width strips for each of one of the legs tang border portions integrally joining the respective tang border portion to at least one of the adjacent tab portion and ring portion.

4,159,768

FOLDABLE DEVICE FOR SUPPORTING A REEL

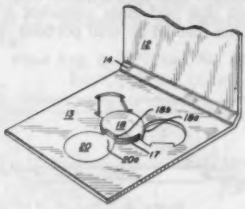
Charles A. Manis, Arlington, and Gary B. Overcash, Haltom City, both of Tex., assignors to Packaging Corporation of America, Evanston, Ill.

Continuation of Ser. No. 605,769, Aug. 18, 1975, abandoned. This application Aug. 7, 1978, Ser. No. 931,858

Int. Cl.[2] B65D *85/02, 85/67*

U.S. Cl. 206—396 **8 Claims**

1. A foldable support for a reel having a hub opening, comprising a panel, and a plurality of struck-out elements foldably connected to said panel and disposed in face-to-face overlapping stacked relation relative to each other and to one surface of said panel and forming a protuberance projecting from said panel one surface and disposed within the periphery thereof,



said protuberance being adapted to extend into the hub opening when the reel overlies the panel one surface.

4,159,769

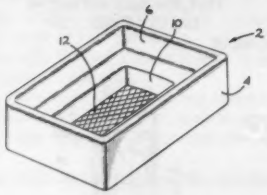
VENDING MACHINE ADAPTER

Philip A. Hatten, 1909 N. Beachwood Dr. #20, Hollywood, Calif. 90068, and Jerome H. Hyman, 108 S. Las Palmas Ave., Los Angeles, Calif. 90004

Filed Sep. 29, 1977, Ser. No. 837,914

Int. Cl.[2] B65D *1/34, 1/36*

U.S. Cl. 206—527 **3 Claims**



1. A vending machine adapter for allowing an item not normally capable of being vended through a vending machine to be vended, said adapter comprising a generally rectangular container of substantially the same size and shape as a package of cigarettes normally vended by a vending machine, said container having one recess configured to hold said item normally not capable of being vended, and a second recess adjacent the bottom of said first recess, said second recess being smaller than said first recess and configured to increase the strength of said container, said first and second recesses forming a ledge thereinbetween upon which said item normally not capable of being vended is seated.

4,159,770

RETAINING DEVICE FOR PLUG-IN UNIT COACTING WITH A CONTACT CARRIER

Willi Beyerle, Rur/Düssel-Strasse, 4044 Kaarst, Neuss, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,676

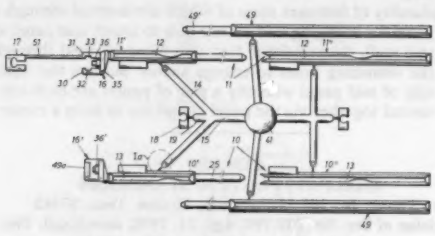
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648661

Int. Cl.[2] B65D *69/00, 85/54*

U.S. Cl. 206—577 **19 Claims**

1. A kit for building a retaining device adapted to hold a contact carrier and a coacting plug-in unit, comprising an assembly of integrally molded elements detachably interconnected by a runner structure, said elements including a pair of elongate guide members and a pair of connectors engageable with respective ends of said plug-in unit, each of said connectors being attached to an extremity of one of said guide members, at least one of said connectors being divided into a male part and a female part matingly engageable with each other

and interconnected by a flexible link, said link forming a loop adapted to embrace a bundle of wire leads emanating from said



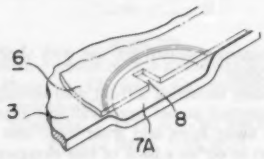
plug-in unit upon a snap-type interfitting of said male and female parts to engage said plug-in unit.

4,159,771

CONTAINER HAVING MULTIPLE INDEPENDENTLY UNSEALABLE COMPARTMENTS

Kenji Komatsu, Mitaka, and Teruyoshi Wakamatsu, Chofu, both of Japan, assignors to Meiji Seika Kabushiki Kaisha and Dai Nippon Insatsu Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 22, 1977, Ser. No. 853,847
Int. Cl.[2] B65D *11/22, 17/24*
U.S. Cl. 206—620 **4 Claims**



1. A container comprising a container main structure having a plurality of hollow receptacles for containing portions of a product or products in a sealed state, adjacent receptacles being integrally connected at their adjacent rims by a common connective rim flange, other outer rims of the receptacles having outer rim flanges and a lid sheet sealingly attached to the connective rim flanges and the outer rim flanges thereby to seal the interiors of the receptacles and thereby to form individually sealed compartments, the lid sheet having at edge portions thereof tear-facilitating means each comprising a slit cut into the edge of the lid sheet at the position of each connective rim flange and thus forming two adjacent free corners of the lid sheet each of which can be pried and pulled upward to partially tear off the lid sheet, the lid sheet being not attached to the container main structure in the neighborhood of each slit, one of said outer rim flanges of the container main structure being formed at its outer edge with slits each at a position coinciding with one slit of the lid sheet and with a pair of slanted score lines connecting the inner end of each of said slits in said outer rim flange with the outer edges of the same at both sides of each slit, thereby to enable depression of a portin of the outer rim flanges defined by the slit and score line so as to facilitate the prying up of a selected free corner of the lid sheet for tearing off the sheet.

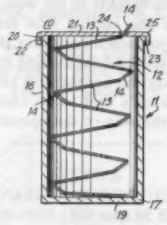
4,159,772

TREATED PAD DISPENSING DEVICE

Harold Beck, Wantagh, N.Y., assignor to Tissue Products Co., Inc., Bronx, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,502
Int. Cl.[2] B65D *5/72*
U.S. Cl. 206—820 **7 Claims**

1. A dispensing device comprising a stack of pads consisting essentially of a long substantially flat, unitary, fibrous web including longitudinally spaced enlarged sections impregnanted with an active ingredient and interconnected at their proximate edges by integrally formed relatively narrow pull tabs, said web being accordian folded along transverse lines



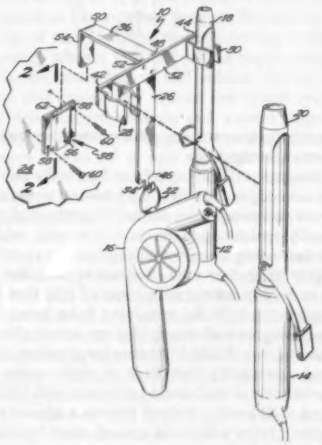
proximate said pull tabs and said enlarged sections being superimprosed into said stack in which said impregnated enlarged sections are in face-to-face contact and with said pull tabs proximate the periphery of said stock.

4,159,773

BEAUTICIAN'S TOOL HANGER

Luigi G. Losenno, 4525 Drexel Ave. South, Edina, Minn. 55424

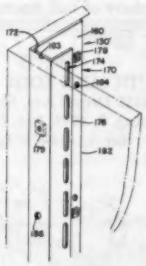
Filed Aug. 9, 1976, Ser. No. 712,933
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—60 T **3 Claims**



1. Beautician's tool hanger for attachment of a beautician's tool having a heated portion, a curling iron having a heated portion, and another beautician's tool to a vertical wall, comprising, in combination: an elongated, flat bar-shaped main frame; an elongated, flat, bar-shaped arm having at least one vertical face, with the arm attached substantially perpendicularly to the main frame with the vertical face oriented outwardly toward an operator and away from the main frame to thus form a T-shaped member; a first pressure clip for receiving the heated portion of the beautician's tool; a second pressure clip for receiving the heated portion of the curling iron; with the first and second pressure clips being vertically attached adjacent the opposite ends of the arm and on the vertical face of the arm so that the beautician's tool and the curling iron hang vertically down therefrom; a hook formed adjacent an end of the main frame for receiving a portion of and for attaching the other beautician's tool to the main frame; a stand-off, extension bracket attached to the main frame for spacing the main frame, the arm, and the hook from the wall and for

thermally insulating the main frame and the beautician's tool and the curling iron, located in the first and second pressure clips, from the wall by spacing the main frame and the beautician's tool and the curling iron from the wall to thus provide an air insulation barrier therebetween; and means for attaching the stand-off extension bracket to the wall, wherein at least the beautician's tool and the curling iron are held in a spaced, thermally insulated position away from the wall to thus prevent the beautician's tool and the curling iron from burning the wall and also allowing the beautician's tool, the curling iron, and the other beautician's tool to be easily accessible to the operator and out of the way of the operator when not in use.

4,159,774
SHELF-SUPPORTING STANDARDS
Bruce Young, Jr., 105 Master Rd., Hixson, Tenn. 37343
Division of Ser. No. 679,794, Apr. 23, 1976, Pat. No. 4,083,458. This application Feb. 17, 1978, Ser. No. 879,001
Int. Cl.[2] A47F *5/00*
U.S. Cl. 211—86 **2 Claims**



1. A corner connector for joining together two panels to form a corner, comprising:

a first elongate wall having a front face and a pair of longitudinal side edges, said first wall having a plurality of first fastener receiving holes defined therethrough to be longitudinally spaced apart on said first wall, said first wall front face being a panel abutting face for abutting a panel;

a plurality of anchor nuts attached to said first wall front face to be concentric with some of said first fastener receiving holes with the remaining holes being free;

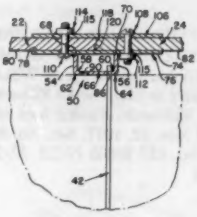
a second elongate wall attached at one longitudinal side edge thereof to one of said front face longitudinal side edges to extend rearwardly therefrom at right angles therewith, the other end of said second elongate wall being free, said second wall having defined therein a plurality of bracket receiving holes which are spaced apart longitudinally on said second wall;

a third elongate wall attached at one longitudinal edge thereof to another longitudinal side edge of said first wall to extend rearwardly thereof at right angles therewith, said third elongate wall having another edge which is free, said third wall having a plurality of second fastener receiving holes defined therein to be spaced apart longitudinally of said third wall, a panel abutting face for abutting a face of a panel, and an opposite face, said second and third elongate walls being in spaced parallelism with each other for essentially the entire lengths and widths thereof so that a J-shape is formed by said elongate walls;

a plurality of anchor nuts attached to said third wall opposite face and located to be concentric with some of said second fastener receiving holes with the remaining fastener receiving holes being free, said free fastener receiving holes in said third wall corresponding to the anchor nut encircled holes of said second wall whereby alignment of a pair of corner connectors aligns anchor nut encircled holes with free holes so that a fastener inserted through a free hole on one corner connector of the pair of corner connectors engages an anchor nut encircling a hole aligned therewith on the other one of the pair of corner connectors;

a plurality of fasteners some of which are inserted through a panel for engaging said anchor nuts to attach said panel to said wall, the remaining fasteners being inserted through the remaining holes to engage anchor nuts on the other side of said panel whereby a pair of panels are each connected together via the panel connector to form a corner.

4,159,775
SHELF-SUPPORTING STANDARDS
Bruce Young, Jr., 105 Masters Rd., Hixson, Tenn. 37343
Division of Ser. No. 679,794, Apr. 23, 1976, abandoned. This application Feb. 17, 1978, Ser. No. 878,981
Int. Cl.[2] A47F *5/10*
U.S. Cl. 211—86 **4 Claims**



1. A wall mounted standard for use with shelf-supporting brackets comprising:

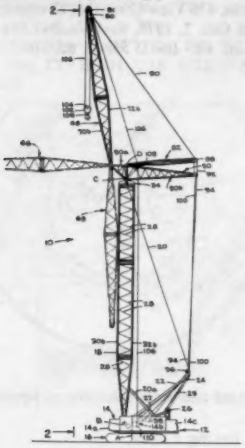
an elongate body including a front wall having side edges and sides attached to said front wall side edges to extend rearwardly away from said front wall, said sides being spaced apart to define a back of said elongate body; and

panel attaching means on said elongate body for attaching two separate panels to said elongate body in a manner such that said two separate panels can be connected together in abutting contact with each other via the wall mounted standard, said panel attaching means comprising an anchor plate fixed to said sides and extending across said elongate body back, and a bolt receiving nut fixed to said anchor plate and a backing plate fixed to said anchor plate by a bolt engaging said backing plate and received in said bolt receiving nut.

4,159,776
TOWER CRANE
Carl F. Holter, Cedar Rapids, Iowa, assignor to FMC Corporation, San Jose, Calif.
Continuation of Ser. No. 668,366, Mar. 19, 1976, abandoned. This application Aug. 19, 1977, Ser. No. 825,890
Int. Cl.[2] B66C *23/62*
U.S. Cl. 212—59 R **4 Claims**

1. In a tower crane comprising a lower works, an upper works pivotally connected to said lower works for rotation about a vertical axis, a tower having front chords and having rear chords, said tower pivotally connected to said upper works for rotation about a horizontal axis, means to hold said tower in a vertical position, a balance arm pivotally mounted on said tower, said arm engaging said tower only on a laterally extending pivot axis midway between the front chords of the tower and the rear chords of the tower, a boom pivotally connected to the front end of said balance arm for swinging movement between a lowermost position along said tower and an elevated position, a live mast pivotally connected at one end to said balance arm, a pendant connected between the other end of said live mast and the boom, wherein the improvement comprises means including a backstay line to connect the rear end of said balance arm to said upper works independent of

any connection to the tower to maintain the balance arm in a substantially horizontal operating position on said tower when



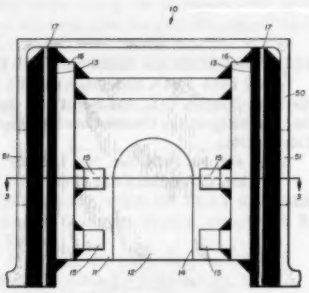
the tower is in a vertical position, and reeving connected between said other end of said live mast and the rear end of said balance arm to control the attitude of said boom.

4,159,777

UNIVERSAL FABRICATED BACKSTOP/BUFFSTOP

Thomas W. Howe, Jr., Clarkston, Ga., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 7, 1977, Ser. No. 848,860
Int. Cl.[2] B61G *7/10, 9/20*
U.S. Cl. 213—10 **10 Claims**



5. A universal backstop/buffstop adapted for use in the center sill of a railcar having a channel in each side wall thereof, said universal backstop/buffstop comprising:

a pair of parallel, juxtaposed side plates, each side plate having a channel therein and key means secured in each channel, said key means having a portion protruding from each side plate;

a forward transverse member having the ends thereof secured to said pair of parallel, juxtaposed side plates, and having a slot located in the center of said forward transverse member; and

a rear transverse member having the ends thereof secured to said pair of parallel, juxtaposed side plates

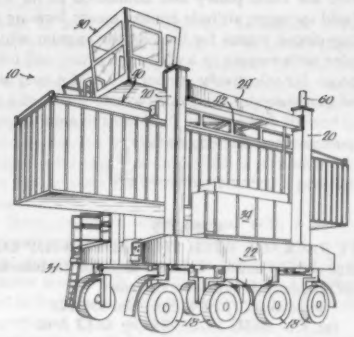
whereby said universal backstop/buffstop is adapted to be received within the center sill of a railcar having a channel in each side wall thereof with the portion of said key means protruding from each side plate slidably engaging the channel in each side wall of said center sill.

4,159,778

STRADDLE CARRIERS FOR CONTAINERS

Philip Pueschner, Wausau; William K. Holmes; Duane L. Thiele, both of Schofield; Richard A. Stearn, Sturgeon Bay; Norbert W. Lenius, Sturgeon Bay, and Lynn L. Keller, Sturgeon Bay, all of Wis., assignors to J. I. Case Company, Racine, Wis.

Continuation of Ser. No. 729,402, Oct. 4, 1976, abandoned. This application Feb. 8, 1978, Ser. No. 876,170
Int. Cl.[2] B60P *3/00*
U.S. Cl. 414—460 **2 Claims**



1. A vehicle having an inverted U-shaped frame defining an elongated container carrying bay between first and second legs with each leg of said U-shaped vehicle having a plurality of ground engaging wheels; first and second engines respectively supported on respective legs of said vehicle; first drive means between said first engine and at least one wheel on said first leg; second drive means between said second engine and at least one wheel on said second leg; a reservoir; first and second pairs of pumps connected to said reservoir and respectively driven by said first and second engines; a hydraulic power steering system for turning said wheels with one of said first pair of pumps supplying fluid thereto; first and second longitudinally spaced transversely extending beams each having opposite ends respectively guided for vertical movement in said bay; a spreader having opposite ends respectively supported on said beams; first and second spreader fluid rams respectively interposed between said beams and respective ends of said spreader; spreader circuit means for supplying hydraulic fluid to said spreader fluid rams with one of said second pair of pumps supplying hydraulic fluid thereto, said spreader circuit means including centering means for automatically centering said spreader between said legs in response to actuation thereof; hoisting fluid ram means supporting said spreader for vertical movement in said bay; said hoisting fluid ram means including first and second cylinder and piston rod assemblies located on respective legs and respectively connected to respective ends of said spreader; hoisting circuit means for supplying hydraulic fluid to opposite ends of said cylinders, said hoisting circuit means including first and second pairs of conduits respectively connected to first and second ends of respective cylinders with first and second control valve means respectively in the respective pairs of conduits, said reservoir being connected to both of said valve means and the other of said pairs of pumps respectively connected to the respective control valve means; a pressure responsive valve means in each of said first conduits normally preventing flow therethrough, each pressure responsive valve means being connected to an associated second conduit to open in response to pressurized fluid in the second conduit and a normally closed valve means between the first end of each cylinder and each pressure responsive valve means and being operable to connect the first end of an associated cylinder to the pressure responsive valve means so that the pressure responsive valve means is opened in response to pressurized fluid in said first end of an associated

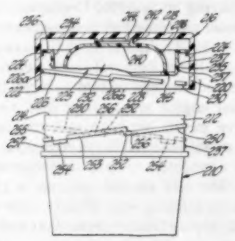
cylinder; each of said piston rods having a first pulley rotatable thereon and first and second operative connections between opposite ends of said spreader and the respective first pulleys; each connection including three elongated flexible members extending parallel to each other with one end connected to said frame and being entrained over a first pulley, a second pulley adjacent an upper corner of said U-shaped frame with an intermediate flexible member entrained over said second pulley, and a third pulley adjacent an opposite upper corner of said U-shaped frame with both outer flexible members entrained over the third pulley and connected to an adjacent corner of said spreader; attitude control means forming part of said hoisting circuit means for limiting the angular attitude of said spreader with respect to a reference plane; and interconnection means for selectively connecting said power steering system and said spreader fluid rams to one pump of a pair of pumps and both of said hoisting fluid rams to another pump of a pair of pumps when one engine fails.

4,159,779

SAFETY PACKAGE WITH THREADED STOP LOCK

Peter Hedgewick, Windsor, Canada, assignor to International Tools (1973) Limited, Windsor, Canada

Filed Aug. 7, 1978, Ser. No. 930,221
Int. Cl.[2] B65D *55/02, 85/56;* **A61J** *1/00*
U.S. Cl. 215—214 **5 Claims**



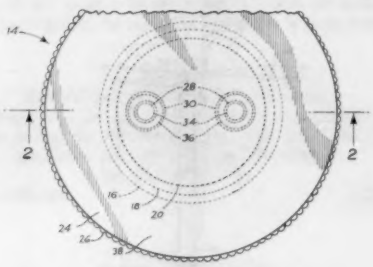
1. A safety closure assembly comprising: a cap having an end wall with a skirt projecting axially from the periphery thereof and having a free end spaced axially from said end wall with cap locking means formed on the inner surface of the skirt adapted to be engaged with and disengaged from complementary container locking means on a container by combined axial and rotary motion of the cap relative to the container; a spring and sealing member for sealingly engaging a container to which the cap is adapted to be applied and at the same time biasing the cap locking means into locked engagement with the container locking means, said spring and sealing member including an axially extending sealing surface adapted to be received in the mouth of the container for sealing engagement with the inner surface thereof; retention means on the cap for preventing axial separation of said spring and sealing member from said cap; said cap locking means including at least two sets of cap locking elements, each set of cap locking elements being disposed in two helical paths on the inner surface of said skirt and extending from a trailing end to a leading end in the direction from said end wall to the free end of said skirt, each set of cap locking elements including an elongated thread-like rib having a trailing end located at the trailing end of said first helical path and a leading end; said cap locking elements further including a pair of spaced locking lugs located in the second helical path; offset from said first helical path on the side of said first helical path opposite the free end of the skirt, the second lug being located between said first lug and the leading end of said thread-like rib and spaced from said first lug.

4,159,780

CHILD-RESISTANT CONTAINER ASSEMBLY

Richard A. Romaine, 475 View Crest Dr., Gresham, Oreg. 97030

Filed Oct. 2, 1978, Ser. No. 947,351
Int. Cl.[2] B65D *55/02, 85/56*
U.S. Cl. 215—215 **7 Claims**



1. A child-resistant container assembly comprising in combination:

(a) a container having a neck,

(b) a closure insertable in the neck with the plane of its upper surface extending not substantially beyond the plane of the upper surface of the neck,

(c) rotary interengaging means interengaging the closure and the container neck,

(d) a key adapted to overlie the closure, and

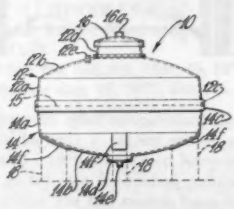
gravity-actuated pin and socket means releasably interengaging the closure and the key, and operative to engage the closure with the neck and to disengage it therefrom.

4,159,781

GLASS FIBER REINFORCED THERMOSETTING RESIN TANK FOR PROCESSING OLIVES

David H. Bartlow, Conroe, Tex., and Robert M. Sommerkamp, Mt. Union, Pa., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 10, 1978, Ser. No. 922,946
Int. Cl.[2] B65D *7/02, 7/00*
U.S. Cl. 220—5 A **8 Claims**

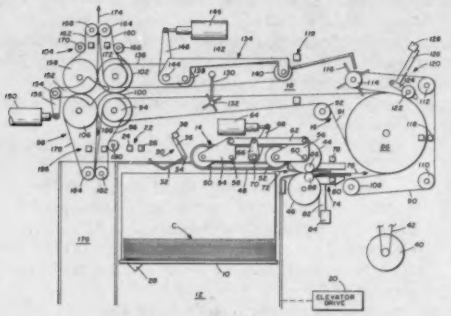


1. A glass fiber reinforced thermosetting resin olive processing tank comprising upper and lower tank halves each including a generally cylindrical portion and a generally spherical portion, the cylindrical portions being joined together and the spherical portions respectively forming the top and bottom of the tank, the upper spherical portion being provided with an upwardly convergent frustoconical manway, and a pair of perforated semicircular olive retaining plates removably mounted in the upper tank half adjacent the lower end of the manway with straight peripheral edge portions thereof abutting each other.

4,159,782
BANKING MACHINE CONTROL

Robert F. Swartzendruber, Plano, Tex., assignor to Docutel Corporation, Irving, Tex.

Filed May 2, 1977, Ser. No. 792,930
Int. Cl.[2] B65H *7/14, 7/12, 29/60*
U.S. Cl. 221—1 19 Claims



1. A method of controlling the dispensing of bank notes from a banking machine responsive to externally generated control signals, comprising the steps of:

feeding back notes from a storage bin along a transport path of a tranport system,

returning all but one bank note fed to the transport system back to the storage bin,

timing the travel of a bank note past a check point displaced from the start of the transport path of the transport system to monitor for an overlapping note condition,

sensing for the presence of multiple notes traveling together through the transport system only after completion of the timing function at a location displaced downstream from the check point along the transport path by a distance such that the bank note has partially passed the location at the completion of the timing function,

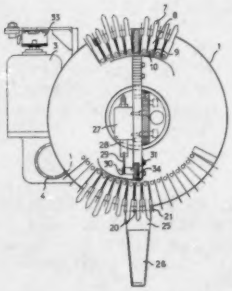
assembling bank notes delivered from the transport system in an escrow station, and

transporting the assembled notes from the escrow station to an exit throat.

4,159,783
SELECTOR-DISPENSER OF FLAT KEY BLANKS

Serge Crasnianski, Grenoble, France, assignor to Kis-France, Grenoble, France

Filed Sep. 20, 1977, Ser. No. 835,172
Claims priority, application France, Oct. 1, 1976, 76 29616
Int. Cl.[2] G07F *11/00*
U.S. Cl. 221—13 15 Claims



1. In an apparatus for automatic selecting and dispensing a key blank corresponding to a specimen key to be reproduced having

a rotatable drum structure (1)

radial cells (20) in each of which stacked blanks of the same model can be located provided in said drum structure;

and ejector means (27, 28, 32) for ejecting a blank opposite to which a cell, containing blanks of the selected type has been moved by a rotary movement of the drum structure controlled by insertion of a specimen key (40) to be reproduced into a template (35) formed with at least one slot (36) having, in cross-section, a form identical to that of the specimen key,

wherein in accordance with the invention, a number of superposed series of cells (20) are uniformly distributed on the periphery, of said drum structure (1), the cells of said series of cells being in vertical alignment, and each cell being capable to store a magazine (6) containing a supply of key blanks (7, 8) of a same type;

an electric motor (3) is provided connected to rotate the drum; and a magnetic brake (33) is provided for blocking the motor when the drum has reached a preselected position;

said drum structure being formed with a central axially extending aperture;

a fixed support located within said aperture of the drum, the ejector means (27, 28, 32) being carried by said support and including one ejector device provided for each of said superposed series of cells,

all ejector devices being disposed in a same diametrial plane of the drum; said template including a control panel strip (35), the number of slots (36) in said strip corresponding to the total number of cells, for introduction of specimen keys (40), said slots being arranged in groups each of which have the number of slots corresponding to the number of superposed series of cells;

means (37) controlled by insertion of a specimen key in a slot for establishing power supply to the motor circuit to start the motor (3), cam means (22) associated with each of said superposed series of cells, a cam operated switch (24) associated with each of said cam means to coact therewith when a selected cell containing a desired blank is brought in front of the ejector devices, and a relay controlled circuit means in which said switch is inserted for cutting off the motor (3), for operating the magnetic brake (33) and for operating the ejector means (27, 28, 32) corresponding to the selected one of said superposed series of cells.

4,159,784
DEVICE FOR DISPENSING ADJUSTABLE VOLUMES OF A LIQUID

Eric M. d'Autry, 69-72, rue Gambetta, 95400 Villiers-le-Bel, France

Filed Jul. 18, 1977, Ser. No. 816,448
Claims priority, application France, Aug. 18, 1976, 76 25082
Int. Cl.[2] B67D *5/26*
U.S. Cl. 222—32 12 Claims

1. In a device for dispensing adjustable volumes of a liquid, the combination of:

a stopper mounted on the neck of a flask or like recipient containg a liquid, which incorporates a device with valves arranged to allow the taking and dispensing of the liquid and which comprises a suction tube immersed in the liquid, as well as a dispensing tube;

a calibrated cylinder which is hermetically mounted in said stopper, which communicates with said suction tube and which comprises, near its free upper end an outwardly projecting fixed annular stop;

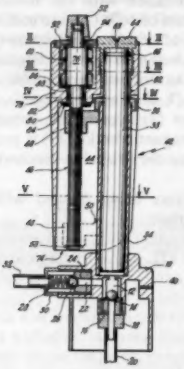
a calibrated cylindrical plunger adapted to cooperate with said calibrated cylinder;

a body for actuating said calibrated plunger, internally defining a first cavity in which a threaded adjusting shaft is adapted to be housed, wherein said shaft is immobile in

translation in said first cavity and which, when rotated, may modify the vertical position of a nut immobilised in rotation which, by cooperation with said annular stop, acts as stop limiting the upward stroke of said calibrated plunger;

a digital display system mounted on the upper part of said threaded shaft so as to be controlled by the rotation of said shaft so as to furnish an indication of the translation of the vertical position of said nut and therefore the value of the volume of liquid to be dispensed;

a member for driving said shaft in rotation, and



means for connecting said actuator body with the upper part of said calibrated plunger wherein said means for connecting the plunger with said plunger actuating body are in the form of a second cylindrical cavity in said body, a cap fast with said plunger being adapted to be removably fixed in said second cavity wherein, in the vicinity of said calibrated cylinder, the lateral wall defining said body presents an opening extending from the lower end of said body substantially as far as the upper end of the calibrated cylinder with allowing the disengagement of said body, thus enabling it to be disconnected from the rest of the device once the plunger and its cap have been removed.

4,159,785

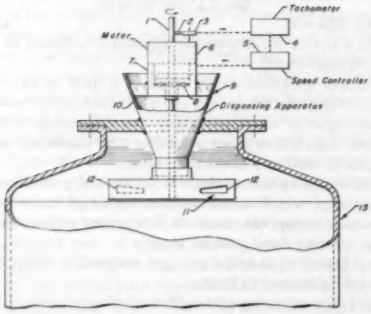
METHOD FOR LOADING PARTICULATE MATTER IN A VESSEL

William M. Berry, Jr., Woodridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 691,723, Jun. 1, 1976, abandoned. This application Jul. 14, 1977, Ser. No. 815,876

Int. Cl.[2] B67D *5/08*

U.S. Cl. 222—63 **1 Claim**



1. A method for loading solid catalytic particulate matter to an elongated catalytic hydrocarbon conversion vessel, at a substantially constant rate of loading, uniformly across a given area of said vessel by discharge of said particles from a rotatable discharge member consisting of a fluid operated driving means having a variable drive speed and dispensing apertures situated on the trailing edge of said discharge member wherein said solid catalytic particulate matter is deposited in a downflow direction to said vessel at a rate of fill of said vessel of up to twenty vertical inches per minute and at an average free fall distance of said particulate matter through a gaseous medium of at least one foot after exit from said discharge member's dispensing aperture which comprises:

(a) sensing the rotational speed of said rotatable discharge member's drive means;

(b) generating a first signal representative of said drive mean's rotational speed;

(c) comparing said generated signal with a predetermined signal representative of the desired rotation speed of said discharge member's drive means;

(d) generating a second signal representative of the differential between said generated signal and said predetermined signal; and

(e) transmitting said resultant second signal to said fluid operating driving means to vary the rotational speed of said discharge member to the desired rotational speed.

4,159,786

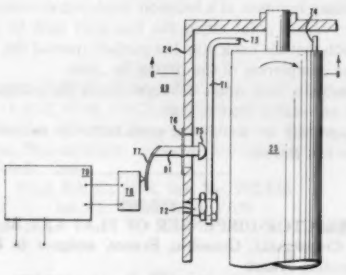
PERIODICALLY EXCITED LEVEL CONTROL PROBE

Nicholas Biddle, III, and Roger A. Patterson, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 11, 1977, Ser. No. 850,670

Int. Cl.[2] G03G *13/00*

U.S. Cl. 222—64 **9 Claims**



1. An apparatus for controlling the level of toner particles in the sump of a decorator adapted to apply toner particles to a latent image said decorator containing at least one rotatable member, adapted to periodically strike a probe rod located within said sump and capable of vibrating whereby said probe is caused to vibrate, sensor means to sense whether or not the vibration of the probe is being damped by toner particles in the sump, drive means actuated by said sensor means adapted to add toner to said sump when the vibration of the probe is not being damped by toner.

4,159,787

CLAMP FOR TUBE DISPENSERS

Steven Wright, 22632 Main St., Hayward, Calif. 94541

Filed Aug. 24, 1977, Ser. No. 827,178

Int. Cl.[2] F65D *35/20*

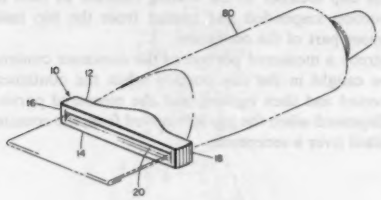
U.S. Cl. 222—103 **10 Claims**

1. A clamp device for effectively evacuating the contents of a flexible tube dispenser comprising:

A. upper and lower arm portions of sufficient length to

accept the width of a tube dispenser, said arm portions being further characterized as having:

1. a straight trailing side;
2. a forward side having a centrally located protruding curved portion which merges into straight sections at the ends of said arm portions;
3. opposing lengthwise arcuate surfaces such that said arm portions are thickest at their centers;



4. opposing rounded lengthwise side edges on said trailing and forward sides; and

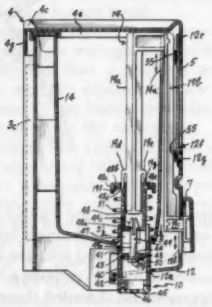
B. end members being connected to said upper and lower arm portions for maintaining separation between said upper and lower arm portions said separation defining a gap therebetween to accept said flexible tube dispenser.

4,159,788

WALL MOUNTED FLUID DISPENSER

John S. Doyel, 404 W. 20th St., New York, N.Y. 10011

Filed Sep. 12, 1977, Ser. No. 832,731
Int. Cl.[2] B67D *5/60*
U.S. Cl. 222—144.5 **7 Claims**



1. A dispensing apparatus comprising:

a facade member having an upper peripheral edge;

container means, mounted on said facade member, for retaining a fluid substance to be dispensed and having an open-mouthed top with an upper peripheral edge and an interior rim;

wall-mounting means, having an upper peripheral edge, for mounting said facade member and said container means on a wall;

cover means, extending over said upper peripheral edges, for covering said facade member, said container means and said wall-mounting means and having means on its under side, cooperating with said interior rim, for sealing the top of said container means;

valve means in the bottom of said container means for controlling the dispensing of said fluid substance therefrom;

means for operating said valve means comprising:

a first arm extending substantially vertically into the interior of said container means and connected to said valve means;

a second arm extending substantially vertically between said container means and said facade member;

means for connecting the upper ends of said first and second arms;

means on said second arm, extending through said facade member, for receiving a finger-operated button thereon;

means for urging said valve means in the upward direction; and

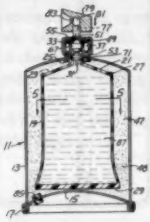
means defining a slot in the lower portion of said facade member for accommodating said button receiving means in up and down motion, the upper edge of said slot limiting the upward motion of said button receiving means.

4,159,789

UNIVERSAL DISPENSING SACK AND VALVE ASSEMBLY FOR PRESSURIZED DISPENSERS

William R. Stoody, 15472 Collins, Romulus, Mich. 48174

Filed Dec. 14, 1977, Ser. No. 860,354
Int. Cl.[2] B65D *83/14*
U.S. Cl. 222—148 **14 Claims**



1. A pressurized dispenser comprising an apertured vessel having a pressure chamber;

at least one impervious sack of flexible material loosely nested and suspended within said chamber and spaced from the walls thereof holding a fluid-like material to be dispensed;

a neck on one end of and integral with said sack having a bore, projected through and secured to said vessel, suspending said sack within said vessel;

said neck defining a valve housing;

and a valve component assembly and an apertured valve retainer enclosing and overlying said neck and sealingly secured thereto;

said valve component assembly projected down into and movably nested in said neck;

there being a pressurized propellant sealed within said pressure chamber for applying continuous pressure to said sack over substantially all its exterior surfaces;

manual unseating of said valve component assembly releasing controlled quantities of said fluid-like material through said neck and nozzle, said sack walls gradually collapsing until all material therein is dispensed said neck having an annular groove therein; the securing of said neck within said vessel including an annular outturned lip on said vessel engaging said neck and sealingly nested within said groove; the securing of said valve retainer to said neck including an inturned annular flange means on said retainer engaging said container lip and snugly rested within said groove.

4,159,790

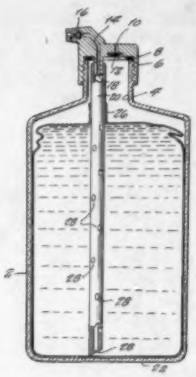
DISPENSING CONTAINER

Vincent R. Bailey, 2914 N. Flagler Dr., W. Palm Beach, Fla. 33407

Filed Dec. 19, 1977, Ser. No. 862,108
Int. Cl.[2] B65D *37/00*
U.S. Cl. 222—211 **6 Claims**

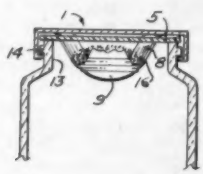
1. A dispensing container comprising a compressible bottle

having a neck portion, a cap comprising a cylindrical wall portion, a top portion and spout portion attached to said neck portion, said cap having an inlet passageway extending through said top portion of said cap in a direction axially of said bottle, a first one-way valve disposed in said inlet passageway and operable to permit flow of air through said inlet passageway into said bottle, said cap having an outlet passageway extending through said spout portion of said cap, said spout portion being fixed at an angle to the axis of said bottle, said outlet passageway having a chamber therein, a second one-way valve disposed in said outlet passageway chamber and operable to permit flow of liquid from said bottle through said outlet passageway, said cap having as an integrally molded



portion thereof a cylindrical protrusion extending into said neck portion along a line off-set from said axis of said bottle, said outlet passageway extending axially of said protrusion and parallel to said inlet passageway, a tube fitted upon said protrusion and extending toward a bottom portion of said bottle, and a flexible bag having a cylindrical neck portion off-set from a lengthwise axis of said bag and fixed upon said tube, said bag being disposed in said bottle and being adapted to retain said liquid therein, a portion of said tube disposed within said bag having opening means to facilitate flow of said liquid into said tube, said opening means comprising a plurality of holes in wall portions of said tube disposed within said bag, said tube being devoid of openings in a portion thereof outside of said bag.

4,159,791
MEASURING AND DISPENSING DEVICE
William C. Crutcher, 178 North St., Middlebury, Conn. 06762
Filed Apr. 4, 1977, Ser. No. 784,244
Int. Cl.[2] G01F *11/26*
U.S. Cl. 222—454 **6 Claims**



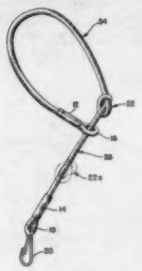
1. A measuring and dispensing device for the contents of a container having a cylindrical neck with a rim, said container provided with a removable top having means cooperating with the container neck for tightening the top against the rim, said measuring and dispensing device comprising:

a cup member having a cup portion sized to hold a preselected measure of the contents of the container and also having a plurality of spaced flexible support legs extending away from the open end of the cup portion, and

a substantially flat sealing member having a peripheral edge adapted to form a seal between the rim of the container and the top and also adapted to retain the sealing member in said top, said sealing member being provided with at least one aperture inside said peripheral edge arranged to receive the ends of said support legs, said flexible legs being adapted to be flexed and inserted for attachment of the cup member to the sealing member to hold the cup portion suspended and spaced from the top inside the upper part of the container,

whereby a measured portion of the container contents may be caught in the cup portion when the container is inverted and then righted, and the measured portion then dispensed when the top is removed from the container and tilted over a receptacle.

4,159,792
SKI GLOVE LEASH
Sanford Siegal, 8045 NW. 36th St., Miami, Fla. 33166
Filed Jan. 23, 1978, Ser. No. 871,892
Int. Cl.[2] A44C *5/00*
U.S. Cl. 224—267 **7 Claims**



1. A glove tether for attaching a glove around the wrist area of a wearer; and comprising a single length of flexible cord between a formation at one end with the cord terminal portion looped and secured to itself to provide a free end eyelet formation and the opposite end threaded through the eyelet formation providing a loop or band portion to encircle the wrist area of a wearer and a tether portion extending therefrom; wherein said opposite end has means for attachment to a glove permitting the glove to be temporarily removed from hand covering position while maintained connected to the band portion which remains in encirclement with the wrist area of the wearer holding the glove in accessible position to be re-applied as a hand covering; wherein the cord terminal portion at each end of the cord is secured to itself within an adjacent eyelet formation by a clamp of predetermined transverse cross-section relative to the eyelet formation at said one end of the cord and wherein the eyelet formation at said one end is slightly larger than the eyelet formation at the opposite end whereby to facilitate threading of the latter and its associated clamp through the eyelet formation at said one end of the cord in forming the loop or band portion; and wherein the cord is knotted along the length thereof for size adjustment before threading of said opposite end through the eyelet formation at said one end of the cord with the said eyelet formation in proximate position relative said knot to prevent undue tightening of the band portion.

4,159,793

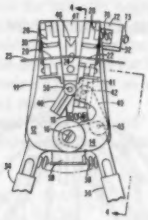
HAND-HELD TOOL FOR OPTICAL FIBER WAVEGUIDE END PREPARATION

Carl Belmonte, Somerville; Mark L. Dakss, Sudbury, and John E. Fulenwider, Concord, all of Mass., assignors to GTE Laboratories Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 778,885, Mar. 18, 1977, Pat. No. 4,074,840. This application Feb. 16, 1978, Ser. No. 878,217

Int. Cl.[2] B26F *3/00*

U.S. Cl. 225—96.5 **16 Claims**



1. A hand-held tool for the preparation of optical fiber waveguide ends comprising

a pair of jaw members coupled for separating rotational movement about a pivot axis;

means for biasing the jaw members in a comparatively unseparated position;

first and second fiber supporting surfaces respectively located on a different one of the jaw members for receiving and supporting an optical fiber waveguide generally circumferentially about the pivot axis;

a third fiber supporting surface between the first and second fiber supporting surfaces and generally aligned therewith;

a pair of spaced-apart handle members adapted for movement by a squeezing human hand;

fiber clamping means responsive to movement of the handle members for exerting a waveguide securing force against the first and second fiber supporting surfaces and for exerting a jaw member separating force in response to further movement of the handle members thereby inducing a tensile stress along the waveguide;

a descendable cutting blade releasable from a position above the third fiber supporting surface for contacting the portion of the fiber waveguide thereon to produce a microcrack in the waveguide periphery whereby the induced tensile stress in the waveguide coupled with the circumferential support thereof causes a diametric propagation of the crack across the waveguide to produce an appropriately prepared fiber end; and

stop means for limiting movement of said cutting blade to prevent the cutting blade from contacting the third fiber supporting surface.

4,159,794

SHEET FEED TRACTOR

Alan F. Seitz, Harwinton, Conn., assignor to Data Motion Incorporated, Torrington, Conn.

Filed Oct. 31, 1977, Ser. No. 847,236

Int. Cl.[2] B65H *17/34*

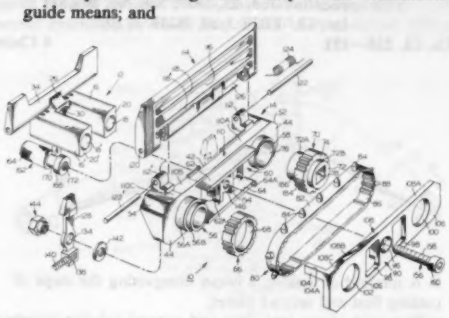
U.S. Cl. 226—75 **18 Claims**

1. A self-contained drive tractor adapted to be mounted upon a printer support and engaged by a drive member for driving web material comprising:

(a) an elongated base member having guide means extending transversely thereof and base mounting means for locking said base member on a printer support;

(b) a chassis movably mounted on said base member, said chassis having tacking means engaged with said guide means for movement therealong;

(c) web driving means movably mounted on and contained within said chassis and adapted to be operatively connected to a drive member to be driven thereby in a path of travel, said web driving means including web engaging means thereon adapted to engage a web material for driving thereof along a portion of said path of travel defining a drive path extending transversely of said base member guide means; and



(d) threaded positioning means operatively connected between said chassis and said base member to selectively laterally shift said chassis transversely of said base member and said drive path, said tracking means following said base member guide means whereby said shifting of said chassis and thereby of said web engaging means is guided transversely of said drive path.

4,159,795

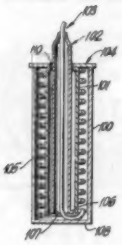
TELESCOPING WIRE DISPENSER

Louis Friedman, 62 Cardinal Dr., East Hills, N.Y. 11576

Filed Jan. 16, 1978, Ser. No. 869,591

Int. Cl.[2] B65H *49/04*

U.S. Cl. 226—127 **16 Claims**



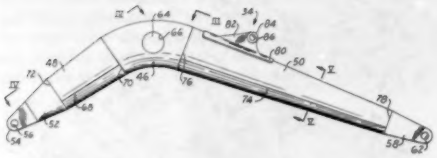
1. Apparatus for dispensing wire comprising a first elongate cylindrical tube having an aperture at one end thereof, and a blocking wall at the opposite end thereof, a second elongate cylindrical tube positioned within said first tube and having a first aperture at the upper end thereof, and a second aperture at the lower end thereof, said upper end of said second tube extending through the first tube aperture, and a length of flexible wire coiled outside the outer circumference of said second tube and within the inner circumference of said first tube, one portion of said wire extending through said second tube from said second aperture thereof to said first aperture thereof, whereby said second tube and the wire portion contained therein can be extended outwardly from said first tube aperture.

4,159,796

METHOD FOR MAKING A BOOM

Arthur B. M. Braithwaite, Ickleton, near Saffron Walden, England, assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 712,555, Aug. 9, 1976, Pat. No. 4,069,637.
This application Jun. 23, 1977, Ser. No. 809,571
Int. Cl.[2] E02F 3/38; B23K 31/02
U.S. Cl. 228—151 4 Claims



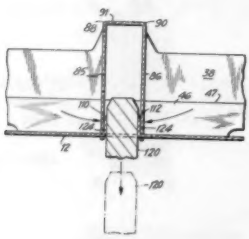
1. A method of making a boom comprising the steps of
cutting first and second plates;
rolling said plates into first and second tubular members, each having a circular cross section and abutting edges extending longitudinally thereof;
welding said abutting edges together by forming a longitudinally extending weld seam which is located at a position below a horizontal axis of a respective one of said tubular members and circumferentially between the horizontal axis and a vertical axis of said respective one of said tubular members, when such tubular member is viewed in cross section, whereby said weld seam is disposed on a lower side of said boom;
selecting elbow means having a circular cross section on each end thereof equal to the cross section of one end of each of said tubular members; and
welding said one end of each of said tubular members to an end of said elbow.

4,159,797

SHIPPING CONTAINER AND BLANK THEREFOR

William F. Roozee, Covina, Calif., assignor to International Paper Company, New York, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,169
Int. Cl.[2] B65D 5/48
U.S. Cl. 229—27 12 Claims



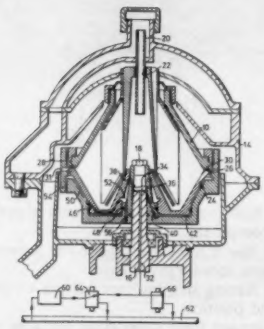
1. A blank for forming a shipping container tray comprising at least two compartments separated by a divider wall, said blank having portions for providing, in the erected tray, top structure, a bottom, side walls, and end walls; the top structure portion including a transverse bridge part and a pair of divider wall panel flaps hingedly connected to the margins of the transverse bridge part so that when, during erection of the tray, they are turned downwardly, they extend toward the bottom of the tray, thereby forming a hollow strut; and the bottom portion having a pair of center wall tab portions arranged to be turned upwardly along hinge lines that are spaced apart a distance substantially equal to the width of the bridge part, each tab being arranged to be substantially under a margin of the bridge portion in the erected tray so that the downturned divider wall panel flaps are parallel to each other and vertical when they are secured to the center wall tab portions.

4,159,798

DESLUDGER TYPE DISC BOWL CENTRIFUGES

Geoffrey L. Grimwood, Shaley House, Wooldale, Holmfirth, near Huddersfield, and Joseph F. Jackson, 1, W. Royd Villas, Kingcross Rd., Halifax, both of England

Filed May 22, 1978, Ser. No. 908,436
Claims priority, application United Kingdom, May 24, 1977, 21773/77
Int. Cl.[2] B04B 1/14
U.S. Cl. 233—20 A 5 Claims



1. A disc bowl centrifuge comprising a bowl adapted to be rotated about a vertical axis, means for introducing material to be processed into the bowl interior, an annular piston disposed within an annular operating chamber in the lower part of said bowl, the outer periphery of said piston defining an upwardly-extending, first annular valve member, a second downwardly-extending annular valve member contained in the wall of said bowl, said first and second valve members co-operating to form a discharge valve controlling at least one discharge port provided in the wall of said bowl, and means for introducing pressure fluid into said piston chamber, said piston being arranged to be displaceable between an upper position in which said first and second valve members co-operate to close said valve to prevent discharge of material from said bowl, and a lower position in which said first and second valve members are mutually spaced to open said valve and permit discharge from said bowl under the action of centrifugal force, said means for introducing pressure fluid into said piston chamber is such as to admit it at a pressure substantially higher than atmospheric pressure, the magnitude of said pressure being such that, when said valve is in its closed position, the pressure in said chamber beneath said piston is sufficient to hold said valve closed irrespective of the magnitude of opening forces exerted on said piston resulting from pressurisation of its upper face by process material subjected to centrifugal force in said bowl.

4,159,799

CASSETTE UNIT AND FIXTURE FOR LOADING THE UNIT WITH A PLANAR MEMBER

David S. Alles, Convent Station, and Joseph Hill, Middlesex, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 14, 1977, Ser. No. 860,338
Int. Cl.[2] G06K 7/00, 7/04, 13/16
U.S. Cl. 235—486 8 Claims

3. Apparatus for positioning a planar member in a stress-free way in a cassette unit that includes a three-assembly suspension system having a fixed-location spring-loaded clamp member included in each suspension assembly, said apparatus comprising

a base member,

unit hold-down means mounted on said base member for securely holding a cassette unit in place,

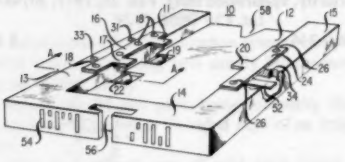
clamp-member actuators mounted on said base member for maintaining said spring-loaded clamp members in an open position when said unit is secured in place by said hold-down means,

movable means slidably mounted on said base member and spaced apart from said holding means for receiving a planar member to be loaded into said unit, said movable means including

retractable means for initially engaging the edges of said member to establish a predetermined position of said member on said movable means,

and member hold-down means for holding said member in said predetermined position as said movable means is moved toward said unit,

said movably means being adapted to move said member into adjacent non-contacting relationship with said unit



free of any side-wall portions thereof and encompassed between but not in contact with said open clamp members during said movement,

said movable means also including a reference stop member for engagement with said unit when said member has been moved into loading registry with said unit,

and means responsive to said stop member engaging said unit for releasing said unit hold-down means and said member hold-down means so that said spring-loaded clamp members are enabled to move relative to said actuators to securely engage said member and said unit is at the same time released from said apparatus.

4. Apparatus as in claim 3 wherein each cassette unit designed to be held in said apparatus includes code information thereon uniquely identifying the unit, and wherein said apparatus further includes

means for reading the code information contained on a unit held in said apparatus.

4,159,800

FUEL CONTROL SYSTEM AND CONTROL DEVICE THEREFOR OR THE LIKE

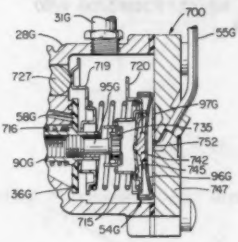
Charles D. Branson, and Roy C. Demi, both of Greensburg, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 742,910, Nov. 17, 1976, abandoned, which is a division of Ser. No. 570,863, Apr. 23, 1975, Pat. No. 4,007,872, which is a division of Ser. No. 530,605, Dec. 9, 1974, Pat. No. 3,989,064, which is a continuation-in-part of Ser. No. 443,783, Feb. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 380,389, Jul. 18, 1973, abandoned. This application Feb. 24, 1978, Ser. No. 880,762

Int. Cl.[2] F16L *5/00*

U.S. Cl. 236—15 A **4 Claims**

1. In a fuel control device having a valve means to be thermostatically controlled by an expandable and contractible power element having a movable wall for operating said valve means and a fixed wall for being carried by said control device, the improvement comprising a one-piece relatively thick manifold having opposed substantially flat parallel sides, said manifold being secured to said device and having passage means therethrough leading from one of said sides of said manifold external to said control device to the other of said sides of said manifold internal of said control device, said power element having said fixed wall secured to said other side of said manifold to be carried thereby and be in fluid communication with said passage means thereof, said one side of said manifold having a substantially flat external surface disposed at an angle relative to said one side other than parallel and being interrupted by said passage means, said flat surface having a part thereof extending into said one side of said manifold and an-



other part thereof extending outwardly from said one side approximately the same distance said part of said flat surface extends into said one side, and a conduit means secured in said passage means at said flat external surface of said one side of said manifold to be carried thereby and be in fluid communication with said passage means thereof.

4,159,801

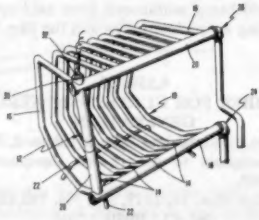
FIREPLACE BOILER

Albert E. Roland, Box 198, Stoney Garden Rd., Kintersville, Pa. 18930

Filed Sep. 19, 1977, Ser. No. 834,493

Int. Cl.[2] F24D *3/00*

U.S. Cl. 237—8 R **16 Claims**



1. A fireplace boiler for heating a liquid, which is adapted to be fitted into a fireplace, comprising:

grate means in which a fire is built, including

a plurality of heating tubes, each tube having a first location and a second location thereon,

a first header connected at the first location of each of the heating tubes, said first header having an inlet port at one end thereof, and

a second header connected at the second location of each of the heating tubes, said second header having an outlet port at one end thereof;

sampling means connected between said first and second headers for allowing a liquid to flow between the headers; and

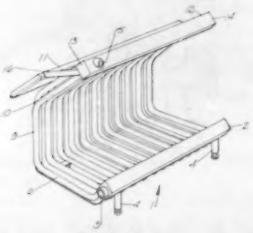
a temperature sensor included in said sampling means for sensing the temperature of the liquid flowing therein.

4,159,802

HEATING SYSTEM UTILIZING FUEL BEARING MULTI-TUBE WATER JACKET

Herman Ficker, 10461 Lockcrest Dr., Cincinnati, Ohio 45231, and John Konrad, 4219 Runningfawn Dr., Cincinnati, Ohio 45239

Filed May 22, 1978, Ser. No. 908,564
Int. Cl.[2] F24D *5/00, 9/00*
U.S. Cl. 237—8 R **15 Claims**



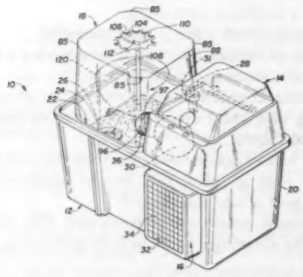
1. A heating system comprising a fuel bearing multi-tube water jacket, said jacket having a lower header, an upper header vertically spaced from said lower header, a plurality of spaced curvilinear hollow heat exchanging tubes connecting said manifolds, and a hollow plate-like baffle connected between said manifolds, said upper manifold having a fluid outlet for exhausting fluid from said water jacket, said lower manifold having a fluid inlet for receiving fluid, said heat exchanging tubes extending rearwardly from said lower manifold to form a support for bearing combustible fuel, the rearmost ends of said tubes forming said platform extending upwardly to form the back wall of said jacket, the uppermost ends of said tubes forming said back extending forwardly to said upper manifold to form an awning-like canopy overlying said fuel bearing support, said baffle being positioned to overlie said fuel bearing support and having an inlet connected to said lower manifold and an outlet connected to said upper manifold, whereby fluid introduced at said lower manifold inlet may be circulated through said heat exchanging tubes and said baffle, said fluid being heated as a result of heat produced by burning said combustible fuel positioned on said fuel bearing support, said heated fluid being withdrawn from said upper manifold outlet for heating an enclosed area and the like.

4,159,803

CHAMBER FOR ULTRASONIC AEROSOL GENERATION

Leon R. Cameto, Oakland, and John R. Edmund, Berkeley, both of Calif., assignors to MistO_2Gen Equipment Company, Oakland, Calif.

Filed Mar. 31, 1977, Ser. No. 783,105
Int. Cl.[2] B05B *17/06*
U.S. Cl. 239—102 **4 Claims**



1. A nebulizing chamber for use with an ultrasonic electro-acoustic transducer adapted to interface with said chamber, said chamber comprising:

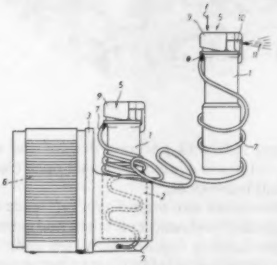
a thin-walled inflatable bag adapted to enclose a liquid and having outlet means comprising a plurality of slits forming flaps in the upper, normally horizontally disposed chamber wall, wherein said slits are arranged in a ring with the arcuate flaps disposed to direct said exhaust radially inwardly so as to generate an ascending convergent outlet flow pattern wherein said chamber includes a retaining means maintaining a depression within said ring upon inflation of said chamber for directing a portion of said exhaust in a convergent, substantially horizontal direction.

4,159,804

MEANS FOR ATOMIZING COSMETIC PRODUCTS

Oscar Rigamonti, Via P. Toselli 21, Milan, Italy

Filed Jul. 11, 1977, Ser. No. 814,447
Claims priority, application Italy, Feb. 25, 1977, 20748/77[U]
Int. Cl.[2] B05B *7/24*
U.S. Cl. 239—346 **4 Claims**



1. A atomizer for cosmetic products in particular hair lacquers, said atomizer comprising:

(A) a pair of lacquer-containing bombs,

(B) a portable compressed air-source,

(C) a housing body having seats for reception of said bombs and for said compressed air-source,

(D) hoses connecting said portable compressed air-source to said bombs,

(E) each bomb comprising

(I) a lacquer containing lower part and

(II) a detachable head mounted on said lower part

(a) said head including a depressible cover with a flat crown,

(III) said head having an atomizing unit, said atomizing unit constituting

(a) a compressed air-nozzle and

(b) a lacquer supplying nozzle,

(IV) passageway means connecting the air-hose for that bomb with the compressed air-nozzle,

(V) a controllable biased check valve interposed in said passageway means,

(VI) passageway means connecting the lacquer in said lower part with said lacquer supply nozzle

(VII) said check valve being in operative relationship to said crown whereby depression of said crown opens said valve

(VIII) said compressed air-nozzle terminating at an orifice

(IX) said lacquer supplying nozzle terminating in a conic end near said orifice

(X) said orifice being separated from said conic end by a notch

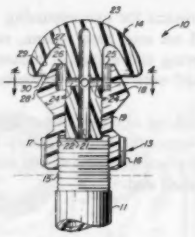
(F) each said hose being wound around its associated bomb to provide a combination transverse dimension of the bomb and hose small enough to be received in the seat of the housing body.

4,159,805

BUBBLER SPRINKLER

Robert W. von Lutzow, 4840 Grandview La., Phoenix, Ariz. 85018

Filed Nov. 7, 1977, Ser. No. 848,984
Int. Cl.[2] B05B *1/30*
U.S. Cl. 239—457 **4 Claims**



1. A bubbler head for an irrigation system comprising:
a valve body comprising two axially interconnected elongated hollow parts,
one end of one of said parts being internally threaded for threadedly engaging a threaded pipe of an irrigation system,
the other end of said one of said parts being internally threaded for threadedly receiving the other of said parts,
the other of said parts being provided with an end having a dish shaped configuration having an externally threaded stem of smaller diameter than the outer diameter of said dish shaped configuration extending axially out of said dish shaped configuration,
said stem threadedly engaging with the threads of said other end of said one of said parts for moving a predetermined distance,
said stem being provided with a first passageway extending axially from its free end toward said dish shaped configuration,
a second passageway interconnecting with said first passageway between its ends and extending laterally thereof to the outside periphery of said stem,
said first part being provided with a bore extending into said other end thereof a predetermined distance and being of a larger diameter than the diameter of said stem to provide a reservoir for water around said stem,
said second passageway interconnecting with said reservoir during a part of said predetermined movement of said stem,
said stem during said predetermined movement moving said second passageway gradually out of alignment with said reservoir to control water flow through the first and second passageways into said reservoir and against said dish shaped configuration for deflection out of said bubbler head.

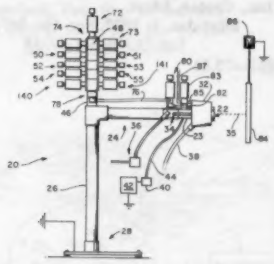
4,159,806

OPERATION SEQUENCE CONTROL SYSTEM

James A. Scharfenberger, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Filed Sep. 12, 1977, Ser. No. 832,439
Int. Cl.[2] B05B *5/02*
U.S. Cl. 239—708 **23 Claims**

7. Apparatus for timing an operation sequence comprising a source of fluid under pressure, a fluid motor coupled to the source for actuation thereby, the fluid motor including an output shaft, a program wheel coupled to the output shaft for rotation, and a plurality of switches mounted adjacent the program wheel and including means responsive to rotation of the program wheel for actuation thereby, the program wheel comprising a drum-type programmer having a plurality of axially spaced-apart cam surfaces, at least one of the switches being located adjacent a respective cam surface and including



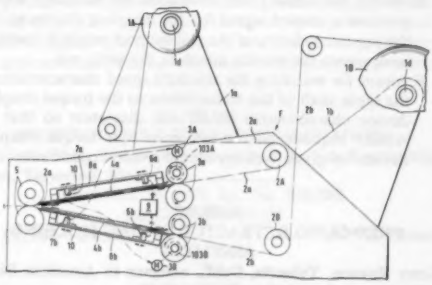
means contacting its respective cam surface for control thereby.

4,159,807

APPARATUS FOR FEEDING SERIATIM DISCRETE WEBS OF PAPER OR THE LIKE

Karl-Heinz Honsel, Bielefeld; Hans-Rudolf Niehaus, Enger, and Karl Mühlenweg, Bielefeld, all of Fed. Rep. of Germany, assignors to Karl-Heinz Honsel, Bielefeld, Fed. Rep. of Germany

Filed Dec. 21, 1977, Ser. No. 862,681
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658385
Int. Cl.[2] B65H *25/04*
U.S. Cl. 242—57 **10 Claims**



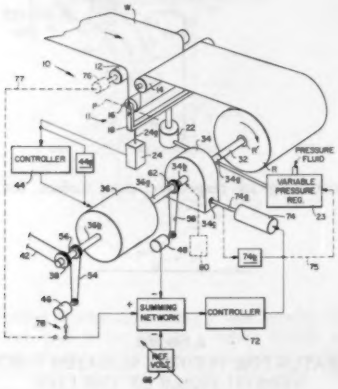
1. In an apparatus for feeding seriatim webs of paper or the like, the combination of first and second support means for discrete sources of finite lengths of webs; transporting means for successive webs; first intermittently actuatable web advancing means between a source in said first support means and said transporting means; second intermittently actuatable web advancing means between a source in said second support means and said transporting means; first guide means defining a first path for movement of a web from said first advancing means into the range of said transporting means; second guide means defining a second path for movement of a web from said second advancing means into the range of said transporting means; and a pair of detectors adjacent to each of said paths, one detector of each pair being nearer to the respective advancing means and including means for generating a signal in response to detection of the trailing end of a web in the respective path, and the other detector of each pair having means for generating a signal in response to detection of the trailing end of a web in the respective path.

4,159,808

VARIABLE RATIO WINDER

Edward F. Meibofer, Norfolk, Mass., assignor to Butler Automatic, Inc., Canton, Mass.

Filed Jan. 6, 1978, Ser. No. 867,385
Int. Cl.[2] B65H *59/38*
U.S. Cl. 242—75.51 **8 Claims**



1. Web winding apparatus comprising

A. means for rotatively supporting a web roll;

B. a variable speed transmission having an input shaft and an output shaft connected to rotate the roll support means;

C. means for changing the gear-in ratio of the transmission in response to an input signal;

D. a torque coupling device for rotating the transmission input shaft, the torque coupling of the device being controllable in response to a control signal;

E. means for sensing the tension in the winding web to produce a control signal for the coupling device so that the angular velocity of the roll support means is varied to compensate for tension upsets in the web; and

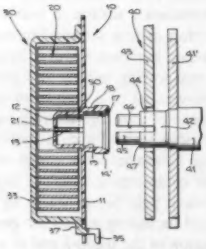
F. means for matching the winder's speed characteristics at the input shaft of the transmission to the torque coupling device characteristics at all roll diameters so that the winder requires only a minimum size torque coupling device for given web speed and tension conditions.

4,159,809

PREWOUND RETRACTOR SPRING HOUSING ASSEMBLY

Gerry Rawson, Valencia, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Jan. 6, 1978, Ser. No. 867,475
Int. Cl.[2] B65H *75/48;* F03G *1/08*
U.S. Cl. 242—107 **12 Claims**



1. A prewound retractor spring housing assembly for mounting to a safety belt retractor having side walls and a belt storage reel shaft end protruding through one side thereof, comprising:

spring mounting base means for receiving a retractor coil spring to be prewound thereon, said base means having frangible means for holding a first end of said coil spring stationary relative said base means until selectively broken to release said first end of said spring from said base means;

spring cup means for encompassing said coil spring when prewound on said base means, said cup means having second spring end engaging means for holding a second end of said coil spring stationary relative to said cup means;

means for locking said cup means to said base means; and

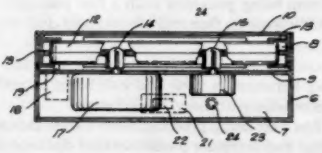
means for mounting said assembly to said retractor in a manner to place said first spring end in biasing relation to said reel shaft end.

4,159,810

CASSETTE RE-WINDING DEVICE

Trevor Hodkinson, 6 Larool Pl., Engadine, Sydney, New South Wales, Australia, assignor to Trevor Hodkinson; Control Switchboards Pty, Ltd. and Neil Charles McCormack, all of New South Wales, Australia

Filed Dec. 12, 1977, Ser. No. 859,738
Claims priority, application Australia, Dec. 15, 1976, PC8503
Int. Cl.[2] G03B *1/04;* G11B *15/32*
U.S. Cl. 242—198 **5 Claims**



1. A battery operated magnetic tape cassette rewinding device for automatically rewinding a cassette having independently mounted spools holding a magnetic tape, comprising:

a generally rectangular housing having a partition therein which divides said housing into first and second compartments and a hinged lid mounted onto said housing over said first compartment, said hinged lid being adapted to receive and pivot to a closed position in which such cassette is in an operative position in said first compartment of said housing;

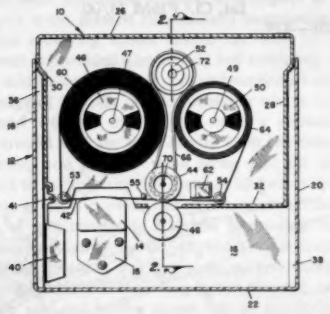
first and second spindles mounted in said partition for rotation, said spindles being adapted to engage the spools of such cassette in said operative position in said first compartment of said housing;

electric rewind motor means mounted in said second compartment in driving connection with said first spindle;

friction braking means mounted in said second compartment in engagement with said second spindle for applying a substantially constant drag to said second spindle; and,

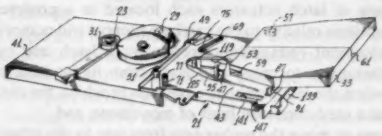
switch means mounted in said second compartment and projecting through said partition into said first compartment for activating said electric rewind motor means in response to direct engagement by such cassette in said operative position in said first compartment in order to automatically rewind the cassette upon placement in said first compartment of said housing.

4,159,811
TAPE TRANSPORT CARTRIDGE
Frederic F. Grant, 14505 Eastbrook, Bellflower, Calif. 90706
Filed Nov. 22, 1976, Ser. No. 743,594
Int. Cl.[2] G11B *15/32, 23/10*
U.S. Cl. 242—192 9 Claims



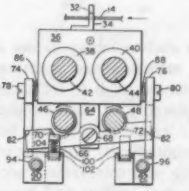
1. A tape cartridge comprising:
shell means defining an enclosure having a cutaway portion along one edge;
a pair of reel hubs supported for rotation on spaced, parallel axes within said enclosure;
means defining a tape path extending between said hubs from that side of a first one of said hubs which is away from the other to the side of a second one of said hubs which is away from the first and past said cutaway portion of the enclosure;
a length of tape extending along said path with its sensitive surface facing toward said edge and being wound convolutely around said hubs to form two tape rolls, one on each hub;
driving means for driving said tape rolls such that one tends to revolve faster than the other by utilizing the difference in velocity at the opposite faces of a drive belt as it is moved through an arc;
said driving means comprising a first roller supported within said housing on a fixed axis located at the side of said tape rolls toward said edge of said enclosure;
said driving means further comprising a second roller disposed on an axis parallel with that of said first roller and said hubs and being translatable within said enclosure at the side of said tape rolls away from said edge; and
said driving means further comprising an endless flexible belt having an inner surface and an outer surface and extending around said first roller with a portion of its inner surface in engagement with an arcuate portion of the outer surface of one of said tape rolls to a point of disengagement from said one of said tape rolls and thence around said second roller with its inner surface in engagement with the outer surface of said second roller from a point of engagement opposite said point of disengagement from said second roller and thence extending between said tape rolls from a point of engagement opposite the point of disengagement of said belt from said second roller and thence back to said first roller;
said belt having a length such that it engages said tape rolls and said rollers without significant slipping and without significant differential stretching along its length.

4,159,812
APPARATUS FOR LOADING A TAPE CASSETTE
Paul D. Cary, Fountain Valley, Calif., assignor to BASF Aktiengesellschaft, Rheinland, Fed. Rep. of Germany
Filed Dec. 8, 1977, Ser. No. 858,634
Int. Cl.[2] G03B *1/04*
U.S. Cl. 242—192 15 Claims



5. Cassette loading apparatus for use with a cassette having opposite sides hinged together, and a tape transport device having a drive capstan, a take-up reel and a carriage mounted supply reel, the supply reel being initially located within the cassette, said apparatus comprising:
a chassis;
first and second pivot arms for engaging opposite sides of the hinged cassette, and being movable with respect to each other to open the cassette, each of said pivot arms having a coupled end and a remote end;
means for coupling together the respective coupled ends of said first and second pivot arms;
said first and second pivot arms being movable relative to each other from a closed position, wherein the cassette is held closed, to an open position, wherein the cassette is held open, the centerline of the opening formed in the cassette being simultaneously moved a predetermined distance in a direction generally lateral to the direction toward the capstan;
guide means for receiving portions of said first and second pivot arms and guiding each of said arms along a predetermined path between said closed and open positions; and
control means operable to move said first and second pivot arms automatically between said closed and open position.

4,159,813
RECIPROCATING TRAVERSE MECHANISM
Thomas L. Yale, Yarmouth, Me., assignor to Yale Engineering Inc., Yarmouth, Me.
Filed Oct. 19, 1977, Ser. No. 843,588
Int. Cl.[2] B65H *54/28*
U.S. Cl. 242—158.4 A 12 Claims



1. In a traverse mechanism comprising a pair of parallel lead screws, a carriage support, a carriage mounted on the support for reciprocating movement longitudinally of the lead screws, a rocker arm pivotal on the carriage and having a pair of ends extending in opposite directions from its pivotal axis, each end having a partial nut thereon, said rocker arm being pivotal between a first position in which one of the partial nuts is engaged with one of the lead screws and a second position in which the other partial nut is engaged with the other lead screw, the lead screws rotating in directions for causing reversal of carriage movement when the rocker arm is moved from

each said position to the other, the combination with said mechanism of

means for mounting the rocker arm pivotally about an axis parallel to the direction of movement of the carriage,

a pair of latches on the carriage each movable to and from a latching position engaging one end of the rocker arm to retain the partial nut on the opposite end thereof in engagement with a lead screw, and

a pair of latch actuators each located in a predetermined position relative to the carriage support and comprising an abutment engageable directly by a latch and operable thereupon to move said latch from its latching position when the latch reaches a position in which the carriage is at a predetermined limit of movement, and

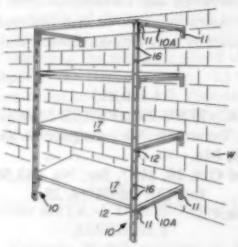
means to move the rocker arm from one to the other of said first and second positions upon each said movement of a latch from its latching position.

4,159,814

FRAMING FOR SHELVES

C. Kenneth Fibus, Youngstown, Ohio, assignor to The Steel City Corporation, Youngstown, Ohio

Filed Jun. 27, 1977, Ser. No. 810,648
Int. Cl.[2] A47B *96/06*
U.S. Cl. 248—243 **2 Claims**



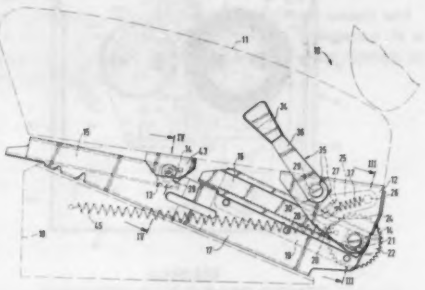
1. Framing for shelves incorporating sections of elongated slotted channel members and apertured L-shaped corner pieces fastened thereto so as to form vertical and horizontal supports for a plurality of shelves, said elongated channel members having a transversely arcuate base portion and oppositely disposed longitudinally extending cross sectionally arcuate flanges joining said transversely arcuate base portion in continuously curving sections and oppositely coplanar outwardly extending continuous substantially flat edge flanges on said arcuate flanges, said L-shaped corner pieces each having an arcuate base portion and arcuate flanges which curve outwardly from said corner piece base portion to define a configuration corresponding to that configuration of said channel members mating with said channel members for intimate contact therewith in nesting relation with said corner piece base received in said channel member base so that said base members contact each other and corresponding ones of said flanges contact each other, said nested, correspondingly configured corner pieces and channel members adding rigidity and shear strength to the framing.

4,159,815

ARRANGEMENT FOR FINE-ADJUSTING THE LONGITUDINAL POSITION OF A VEHICLE SEAT

Willibald Strowik, Remscheid-Lennep, and Paul Werner, Remscheid, both of Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co KG, Remscheid-Lennep, Fed. Rep. of Germany

Filed Dec. 15, 1977, Ser. No. 861,015
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657181
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—429 **11 Claims**



1. An adjustable seat, particularly for use in motor vehicles, comprising a seat component having front, rear and lateral portions; a stationary base component including a front region rising at an angle with respect to the horizontal and a rear region rising at another angle with respect to the horizontal; means for mounting said seat component on said base component for frontward and rearward adjustment relative thereto within an adjustment range, including a pair of guiding arrangements each extending along one of said lateral portions of said seat component and each including a front guide track movably supported on said front region and a rear guide track movably supported on said rear region of said base component, and support members mounted on said seat component and respectively engaging said guide tracks to support said seat component thereon; and means for arresting said seat component in a multitude of adjusted positions relative to said base component within said adjustment range, including at least one rack rigid with said base component, a pinion rotatably mounted on said seat mounting means and meshing with said rack in said adjustment range, a ratchet connected to said pinion for joint rotation therewith, a pawl displaceably mounted on said seat mounting means, and means for displacing said pawl between an arresting position in which said pawl engages, and a releasing position in which said pawl is disengaged from, said ratchet.

4,159,816

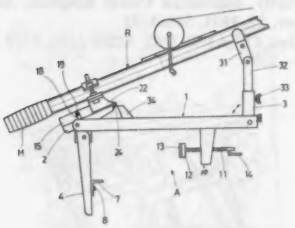
COLLAPSIBLE UNIVERSAL FISHING ROD HOLDING APPARATUS

Toshiaki Miyamae, 36-8, Aramoto, Higashi-Osaka, Osaka, Japan

Filed Dec. 19, 1977, Ser. No. 861,575
Int. Cl.[2] A01K *97/10*
U.S. Cl. 248—515 **3 Claims**

1. A collapsible universal fishing rod holding apparatus, comprising a platform provided adjacent to one end of said apparatus with a long leg portion pivotally movable about said one end to a position at right angles to the plane of said platform, said platform at a selected position opposite to said one end being provided with a short leg portion movable parallel to said platform; a base plate pivotally supported on a first axis at said one end of said platform and being movable relative to the plane of said platform; a receiving means supported on the

plane of said base plate for movement about a second axis perpendicular to the plane of said base plate; a rod holder means fixed on said receiving means and adapted to hold a fishing rod portion in screwably tightened relation; and a telescopic fishing rod supporting means pivotally supported at said opposite end of said platform and movable to a position at right angles to said plane of said platform; wherein said base plate has downwardly extending bilateral edges; said receiving means having an inner rectangular space and being supported on said base plate in movable relation with respect to the plane thereof, with a slit formed substantially intermediate of one side of said receiving means across the axis thereof; and wherein there is provided a traversing rod extending from said slit across said space and having an end supported adjacent to an upper edge of the side of said receiving means opposite to said slit, and wherein there is provided a pressure spring stretched around said slit to normally keep the other end of said traversing rod pressed down along said slit diagonally with respect to said rectangular space of said receiving means; and wherein there is provided head means connected to said other end of said traversing rod and protruding outwardly through said slit; and upwardly curved tongue formed integrally in the extremity of said base plate, said rod holder means being insertable into said receiving means through said space; and wherein said rod holder means has an upwardly curved tang integrally formed in the extremity to be insertable through



said space into the inner recess of said receiving means and a downwardly curved tongue formed opposite said upwardly curved tang and being slightly longer than said upwardly curved tongue and engagable with the upwardly curved tongue between said bilateral edges of said base plate, said upwardly curved tongue being extended integrally from said base, an engagable relation between said rod holder means and said receiving means being effected by permitting said upwardly curved tang to pass beyond a normal position of said traversing rod while keeping the head of said traversing rod raised up manually against the resilience of said spring; whereby said base plate, said receiving means and said holder means are permitted to pivotally move as a unit relative to the plane of said platform by slidably engaging said downwardly curved tongue of the rod holder means with said bilateral edges of said base plate; and whereby said downwardly curved tongue is releasible from an engaged position with said edges of said base plate by slidably moving said upwardly curved tang of the rod holder means to come into contact with said traversing rod normally pressed down by the pressure force of said spring whereby said base plate, receiving means and said rod holder means are pivotally movable together relative to the plane of the platform about said first axis while permitting said receiving means and said rod holder means to rotatively move together relative to the plane of said base plate about said second axis.

4,159,817

MOLD FOR MANUFACTURING DISTILLATION COLUMN PACKING

Reiji Ikawa, Tokyo, Japan, assignor to Tokyo Special Wire Netting Co., Ltd., Tokyo, Japan

Division of Ser. No. 809,329, Jun. 23, 1977, Pat. No. 4,113,810.
This application May 24, 1978, Ser. No. 909,126
Claims priority, application Japan, Jun. 2, 1976, 51-78733
Int. Cl.[2] B01F *3/04*
U.S. Cl. 249—98 **1 Claim**

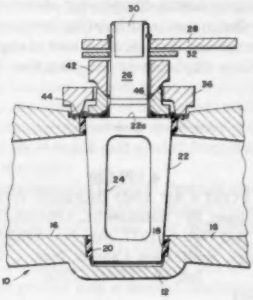
1. An apparatus for manufacturing one subassembly which can be joined to another subassembly of the same structure to form a spherical distillation column packing, comprising: a female mold part having a hemispherical cavity and an inlet port for feeding moldable material into said cavity, said female mold part having a pillar projection extending diametrically from the center of the wall of said cavity toward the open end of said cavity; a male mold part extending across and closing off the open end of said cavity, said male mold part having a generally hemispherical forming projection extending into said cavity, said forming projection having a central opening for receiving said pillar projection, said forming projection having surface portions opposed to the wall of said cavity and defining therewith a hollow generally hemispherical mold recess shaped to define a plurality of cutouts and covering portions formed alternately in the side surface of said mold recess, said forming projection also having means to form an engaging tube on the inner surface of one of said covering portions and projecting toward the open end of said cavity, said forming projection also having means to form an engaging post on the inner surface of a different one of said covering portions which post is shaped to fit into the engaging tube of another like subassembly, said forming projection also having means for forming a plurality of contact pieces which are integral with said engaging tube and said post respectively and which extend toward the center with their adjacent ends being spaced from each other, said pillar projection and said central opening of said projecting portion defining a space for forming a connecting piece connecting the inner end edges of said contact pieces with one another.

4,159,818

ROTARY VALVE TOP SEAL ASSEMBLY

Pieter F. Hoos, Royersford, Pa., assignor to Walworth Company, Valley Forge, Pa.

Filed Sep. 6, 1977, Ser. No. 830,745
Int. Cl. F16k *31/44*
U.S. Cl. 251—214 **7 Claims**



1. In a rotary valve comprising:
a valve body having flow passages therethrough;
a cavity in said valve body opening from the top thereof;
a top closure bolted to said valve body over said cavity;
a valve closure member;
a stem on said closure member rotatable in said top closures; and,

a seal surface on said closure member around said stem and extending generally radially thereof;

a top seal assembly for said valve comprising;

a membrane of semi-rigid, distortable material extending over said cavity opening with outer portions thereof clamped between said valve body and said top closure;

a generally circular opening in said membrane snugly receiving and sealing around said stem;

an under-turned lip around said opening with an annular edge thereof engaging said seal surface;

a loading ring around said stem mounted for movement therealong, the under surface of said loading ring being relieved around the inner diameter thereof overlying said lip; and

means for forcing said loading ring downward to bias said lip against said seal surfaces.

4,159,819

TUBE-DRIVING APPARATUS

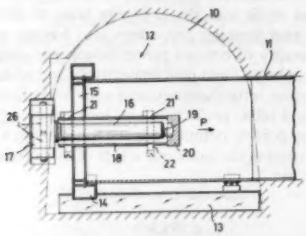
Günther Bargel, and Heinz Hüsemann, both of Werne, Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfalia, Fed. Rep. of Germany

Filed Jan. 26, 1976, Ser. No. 652,477

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1975, 2504967

Int. Cl.[2] E21B *19/00*

U.S. Cl. 254—29 R **9 Claims**



1. Tube driving apparatus having collar means engagable with one end of a pipe to be driven for transmitting force thereto, a plurality of piston and cylinder units for producing said force, and a plurality of separate tension members, each tension member being acted upon by a single piston and cylinder unit, the improvement comprising: clamping devices carried by said collar means, and location means on said tension members for receiving and locating said clamping devices at alternate positions displaced in the direction of driving said pipe.

4,159,820

FENCE POST CAP AND BARBED WIRE ARM

Rudolph E. Parisien, 891 Rainbow St., Ottawa, Ontario, Canada

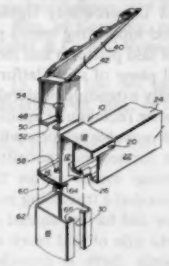
Filed Oct. 6, 1977, Ser. No. 840,047

Claims priority, application Canada, Nov. 1, 1976, 264519

Int. Cl.[2] E04H *17/06*

U.S. Cl. 256—11 **7 Claims**

1. A fence post cap said cap having a side wall, and a bottom wall adapted to be received in an open upper end of a channel type fence post, a top wall including a depending flange, a projection on said side wall adapted to engage a horizontal top rail of said fence and a curved sheet metal member secured to said bottom wall by adjustable means capable of being tightened, said curved sheet metal member and adjustable means being constructed and arranged whereby tightening of said adjustable means causes said sheet metal member to flatten to the extent that edges of said sheet metal member are wedged



against inner walls of said post to hold said cap against upward movement.

4,159,821

COLLAPSIBLE DUAL-HEIGHT WORKBENCH

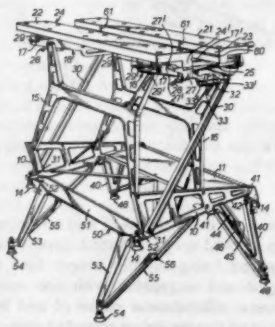
Ronald P. Hickman, Waltham Abbey, England, assignor to Inventec International Limited, Point Robert, Channel Islands

Division of Ser. No. 642,742, Dec. 22, 1975, abandoned, which is a continuation of Ser. No. 511,017, Oct. 1, 1974, abandoned, which is a continuation of Ser. No. 277,118, Aug. 1, 1972, abandoned. This application Mar. 28, 1977, Ser. No. 781,841

Claims priority, application United Kingdom, Aug. 2, 1971, 36269/71; Nov. 22, 1971, 54165/71

Int. Cl.[2] A47B *3/08*; B25B *1/10, 1/24*

U.S. Cl. 269—139 **52 Claims**



1. A workbench comprising

a top structure, including (a) a vise structure incorporating a pair of vise members having elongate clamping faces and having upper surfaces lying in substantially the same plane, and (b) vise operating means arranged to move the vise members positively relatively toward and away from one another;

at least one row of at least two smooth cylindrical walls formed in one of said vise members and defining two smooth-walled cylindrical bores having axes perpendicular to said plane, said cylindrical walls opening through the upper surface of said one vise member and defining therein at least one row of at least two circular apertures, said row extending generally parallel to the direction of elongation of the clamping face of said one vise member;

at least one smooth cylindrical wall in the other vise member defining a smooth cylindrical bore having an axis perpendicular to said plane, said cylindrical wall opening through the upper surface of said other vise member and defining therein a circular aperture;

a plurality of abutment members each having a shank portion snugly, slidably and swivelably receivable in said cylindrical bores and having an abutment portion projecting above said plane, said abutment portion presenting a workpiece-engaging planar surface parallel to the axis of said bore;

convertible support means, including a horizontal structure and a first set of legs pivotally connected thereto, for supporting said workbench top structure in a first workmode condition at sawhorse height when said first set of legs are folded up and for supporting said workbench top structure in a second workmode condition at workbench height when said first set of legs are folded down;

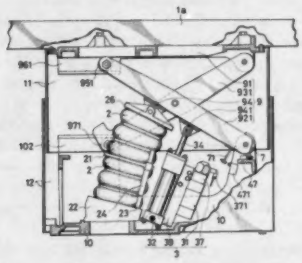
an additional set of legs connected to said top structure and said convertible support means, and collapsible between a storage condition, in which the top structure and additional set of legs are juxtaposed, and said first workmode condition, in which the top structure and said convertible support means are vertically spaced and said horizontal structure is a floor level foot-thrust member.

4,159,822

WORKING MECHANISM FOR A TREATMENT TABLE

Sadayasu Ota, Kyoto, and Keizo Inoue, Uji, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Feb. 27, 1978, Ser. No. 881,627
Claims priority, application Japan, Sep. 12, 1977, 52-110229
Int. Cl.² A61G *13/00*
U.S. Cl. 269—325 **12 Claims**



1. A working mechanism for moving at least a portion of a treatment table comprising:

an expandable and contractable pneumatic spring coupled to said table;

a hydraulic checker coupled to said treatment table; and

a pneumatic cotrol pressure circuit for controling the expansion and contraction of said pneumatic spring and for controling said hydraulic checker whereby the treatment table is smoothly moved and easily maintained in any position.

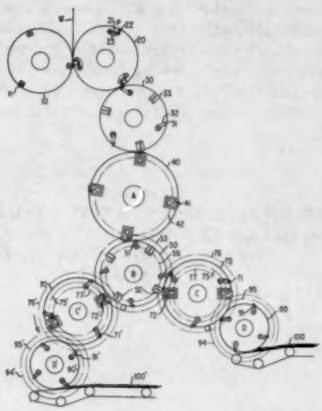
4,159,823

MULTIPLE PRODUCT FOLDER

Jack Bryer, Paramus, N.J.; Dominick Padalino, Brooklyn, N.Y., and Burton C. Polglase, Plainfield, N.J., assignors to Wood Industries, Inc., Middelsex, N.J.

Filed Aug. 12, 1977, Ser. No. 823,949
Int. Cl.² B41F *13/56*
U.S. Cl. 270—21 **8 Claims**

1. In a high speed web fed printing press comprising a web feeding and cutting means and having at least two sets of folding and transfer means for folding and transferring sheets cut from the web; a gear transmission means for driving said folding and transfer means at different speeds and having a plurality of gear members in which at least two of said gear members have different diameters and numbers of teeth; said gear transmission means having a movable coupling means carrying said at least two gear members and mounted for alternatively engaging one of said gear members to selectively



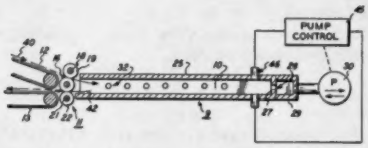
change the relative speed of at least one of said sets of folding and transfer means.

4,159,824

METHOD FOR REVERSING THE DIRECTION OF TRAVEL OF A SHEET

Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 794,691, May 6, 1977, abandoned, which is a continuation of Ser. No. 664,847, Mar. 8, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,329
Int. Cl.² B65H *5/22, 9/00*
U.S. Cl. 271—3 **3 Claims**



1. A method for reversing the direction of movement of sheets of paper of varying dimensions comprising the steps of:

providing a substantially enclosed pneumatic pocket having greater dimensions than said sheets for receiving said sheets and containing said sheets fully within said pocket;

mechanically inserting a paper sheet into an open side of said pocket in a first direction of movement with a first continuously operating mechanical sheet transport;

releasing said sheet inside said pocket from said first mechanical sheet transport;

applying a reversing fluid stream through said pocket, after said sheet has been released inside said pocket, in a second direction opposite from said first direction of movement of said sheet, to reverse the direction of movement of said sheet and to move said sheet back out of the same open side of said pocket into a second continuously operating mechanical sheet transport;

wherein said reversing fluid stream is actuated for a predetermined time interval in response to the sensing of the presence of the lead edge of said sheet at a known position inside said pocket by sheet detection means, after said sheet has been released by said first mechanical sheet transport;

aligning said sheet in said pocket by applying a transverse

fluid stream in said pocket after said sheet is released by said first mechanical sheet transport, said transverse fluid stream being applied in a direction transverse said second direction of said reversing fluid stream to bias said sheet against a side wall of said pocket to align said sheet as it is moved out by said pocket to said second mechanical sheet transport by said reversing fluid stream; and

transporting said sheet away from said pocket with said second mechanical sheet transport in said second direction of movement.

4,159,825

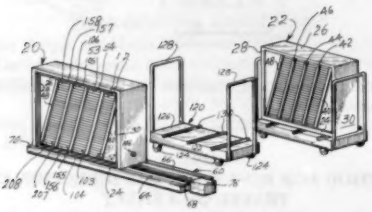
REMOVABLE BIN SYSTEM IN A COLLATOR

David H. Holliday, 15521-15th Ave. NE., Seattle, Wash. 98155

Filed Oct. 11, 1977, Ser. No. 841,113

Int. Cl.[2] B65H *39/10*

U.S. Cl. 271—173 **18 Claims**



14. A removable collator bin system comprising;

a. a collator frame;

b. a bin section and a bin section frame integral therewith;

c. A guide means for said bin section frame on said collator frame;

d. a platform;

e. a guide means for said bin section frame on said platform; and,

f. an aligning means for aligning the two guide means to allow said bin section frame to move onto and off of said collator and said platform.

4,159,826

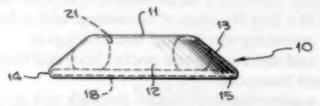
PNEUMATIC JOGGING PLATFORM

John J. Hancock, 4820 W. Slauson Ave., #12, Los Angeles, Calif. 90056

Filed Aug. 19, 1977, Ser. No. 826,257

Int. Cl.[2] A63B *5/00*

U.S. Cl. 272—65 **4 Claims**



1. A pneumatically sustained trampoline jogging apparatus comprising a flat rigid base having a peripheral edge; a continuous flexible covering stretching horizontally above said base, downwardly (at outward angle) beyond said peripheral edge and back under said base; means cinching the margin of said covering under said base; pneumatic tubing means positioned between the top surface of the base and the covering inwardly of said peripheral edge; and inflation valve means in said tubing means whereby on inflation of said pneumatic tubing means said flexible covering forms a pneumatically sustained surface of a trampoline jogging apparatus.

4,159,827

VIDEO DISC PACKAGE

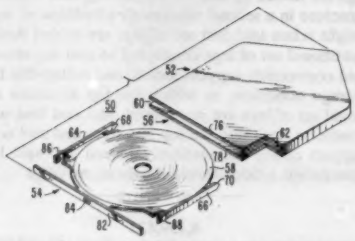
Leslie A. Torrington, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 31, 1977, Ser. No. 801,603

Claims priority, application United Kingdom, Dec. 20, 1976, 53173/76

Int. Cl.[2] G11B *25/04*; B65D *85/30*

U.S. Cl. 274—9 B **5 Claims**



1. A protective cover for a disc record suitable for use with a record player having a record extracting member; said protective cover comprising:

(A) an enclosure having an edge opening in communication with a record enclosing cavity; and

(B) a record retaining member slidably mounted within said cavity for to-and-fro movement therein along a path;

said record retaining member including a spine portion and an annular portion having an opening;

said opening in said annular portion receiving a record during its containment in said cavity so that said to-and-fro movement of said record retaining member causes corresponding movement of said record;

said spine portion extending into said edge opening in said enclosure when said record retaining member is fully inserted therein such that the foremost surface of said spine portion, disposed orthogonally to said path, is substantially even with the surfaces of said enclosure defining said edge opening therein;

said spind portion having a receiving hole extending from said orthogonally-disposed foremost surface along said path toward said annular portion such that when said record retaining member is fully inserted into said enclosure, access to said receiving hole by said record extracting member is permitted only through said edge opening; wherein translation of an occupied cover into said player along a direction parallel to said to-and-fro movement effects reception of said record extracting member into said receiving hole during said translation.

4,159,828

SEALING DEVICE

Sture Östling, and Stig Persson, both of Katrineholm, Sweden, assignors to Aktiebolaget SKF, Goteborg, Sweden

Filed Nov. 25, 1977, Ser. No. 854,725

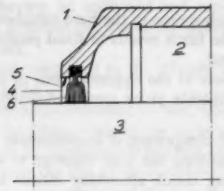
Claims priority, application Sweden, Dec. 23, 1976, 7614503

Int. Cl.[2] F16J *15/32, 15/24*

U.S. Cl. 277—184 **4 Claims**

1. A sealing device for an interspace between two surfaces, characterized thereby, that it incorporates a flexible, elongated body (**7, 14**) with a longitudinal recess (**8**), which body is intended firmly to engage against a first one of said surfaces, two plates (**9, 10**) having a form corresponding to the form of at least a part of said interspace and such profiles that they on one hand can be pushed into the said recess in said body for mutual positioning and on the other hand when pushed into said recess in said body between themselves define a channel

(11), and a sealing member (12, 14*a*) intended to be fitted in said channel, in such a manner that it in the assembled position of



the sealing device engages against the second one of said surfaces.

4,159,829

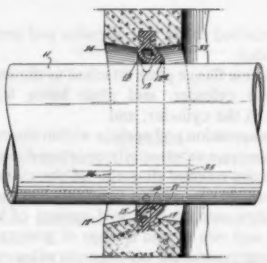
GASKET SEAL BETWEEN SEWER PIPE AND MANHOLE OPENING

John Ditcher, Langhorne, Pa., assignor to A-Lok Products Corporation, Trenton, N.J.

Division of Ser. No. 710,264, Jul. 30, 1976, Pat. No. 4,073,048. This application Sep. 9, 1977, Ser. No. 832,015

Int. Cl.[2] F16L *21/02;* **F16J** *15/32*

U.S. Cl. 277—189 **4 Claims**



1. For use in forming a fluid-tight seal between a sewer pipe and an opening in a manhole through which said pipe passes, a length of a linear extrusion of elastromeric material having a hollow tubular head portion of pear shape in cross section and a foot portion integral therewith, comprising a base flange portion and a web portion of substantial thickness connecting the mid-region of said flange portion with the mid-region of the lower face of the head portion, whereby to provide a pair of longitudinally-extending channels disposed on opposite sides of said web portion and adapted for embedment in cementitious materials between the facing surfaces of the head portion and the flange portion, said length of the extrusion being curved and spliced in the form of a right cylinder with the height of the extrusion extending in an axial direction.

4,159,830

WHEEL TRUCK FOR STEERABLE PLATFORM

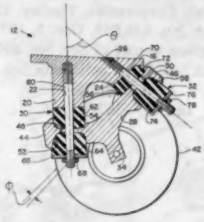
John S. Solimine, San Francisco, Calif., assignor to Fausto Vitello and Eric L. Swenson, both of San Francisco, Calif.

Filed Aug. 23, 1977, Ser. No. 826,982

Int. Cl.[2] A63C *17/02*

U.S. Cl. 280—11.28 **11 Claims**

1. A wheel truck for a steerable platform with a base frame carried by the platform, including the combination of an axeltree for mounting wheel means for rotation, first support means for resiliently mounting a first portion of the axeltree on the platform, said first support means including a first shaft mounted on and extending vertically from the frame together with first elastomeric bushing means mounted about the shaft, second support means for resiliently mounting a second portion of the axeltree on the platform, said second support means including a second shaft carried by the frame and inclining downwardly at an angle with respect to the first shaft together with second elastomeric bushing means mounted about the second shaft, said second support means permitting pivotal movement of the axeltree relative to the platform about an axis inclined at an angle from vertical whereby movement of the



axeltree about the inclined axis relative to the platform creates a steering action as the platform is rolled on the wheel means over a surface, said first and second support means providing the sole direct connection between the base frame and axeltree, and fastener means for locking the second elastomeric bushing means under a selected compressive force whereby steering responsiveness of the wheel truck can be selectively varied.

4,159,831

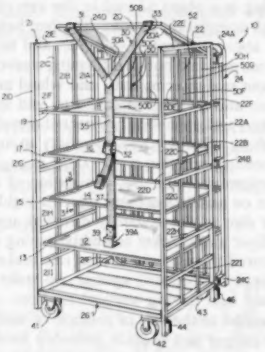
MOBILE EXTRA DISPLAY CONTAINER

Frederick D. Schorr, Decatur, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Dec. 14, 1977, Ser. No. 860,646

Int. Cl.[2] B62B *5/00*

U.S. Cl. 280—79.3 **10 Claims**



1. A mobile display cart comprising:

a movable support including at least one track extending vertically thereof;

a plurality of individually, vertically adjustable shelves for supporting and displaying a plurality of products thereon, said shelves being spring-loaded so as to pivot upwardly against said track after all products are removed from a respective shelf;

means for mounting said shelves for movement in said at least one vertical track;

retaining means for each shelf for preventing said products from sliding off of said each shelf;

a vertically adjustable top member mounted for movement in said track;

linkage means coupled to a lower portion of said frame and to said top member; and

means for adjusting said linkage means for compressing all of

said shelves together to secure said products between said shelves.

4,159,832

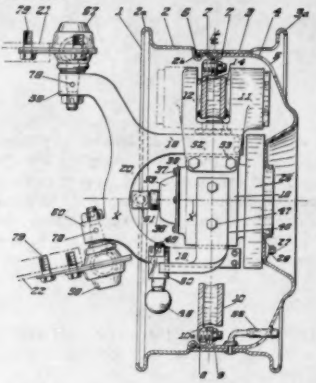
CENTERLINE TWO PIECE WHEEL AND BRAKE ASSEMBLY

Melvin R. Inbody, Findlay, Ohio, assignor to The Centerline Steering Safety Axle Corporation, Findlay, Ohio

Continuation of Ser. No. 638,069, Dec. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 492,438, Jul. 29, 1974, Pat. No. 3,963,260. This application Sep. 26, 1977, Ser. No. 836,673

Int. Cl.[2] B62D *7/08*

U.S. Cl. 280—96.3 **7 Claims**



1. A dirigible wheel assembly for a surface vehicle, comprising: a wheel member; a hub; a wheel spindle journalled in said hub; means supporting said hub for turning movement about a steering axis lying in a plane normal to the axis of rotation of said spindle and comprising a yoke member having parallel arms extending above and below said hub, and bearing means between said arms and said hub and forming a pivot for swinging said hub about said steering axis; said wheel member comprising a tire rim and a spider attached to said spindle by an attaching member, and an inwardly directed annular flange on the inner periphery of said wheel member; an annular brake rotor disc presenting annular brake shoe engaging surfaces lying in planes normal to the axis of rotation of said spindle; attaching means on said brake rotor disc for rigidly attaching the brake rotor disc to the inwardly directed annular flange, and a brake caliper and bracket assembly having a brake caliper housing secured thereto, and at least one brake surface pad for selectively applying pressure against said brake shoe engaging surfaces, said hub having vertical surfaces on each side substantially parallel to the axis of rotation of said wheel spindle, said brake caliper and bracket assembly having supports for said brake caliper housing on opposing sides of said brake caliper housing extending over said yoke and parallel to said axis of rotation of said wheel spindle and mating with said hub surfaces, and securing means for securing said supports to said hub at the mating surfaces.

4,159,833

WIDE RANGE BUMPER MOUNTED HITCH WITH SHOCK ABSORBER ATTACHMENT FOR TOW VEHICLE

Elmo R. Meiners, Anchor, Ill., assignor to M & W Gear Company, Gibson City, Ill.

Filed Jan. 23, 1978, Ser. No. 871,390

Int. Cl.[2] B60D *1/00*

U.S. Cl. 280—478 R **3 Claims**

1. An improved tow bar for vehicles comprising,

(a) a horizontal base member with an inside and an outside, said outside including an elongated horizontal channel;

(b) first and second horizontal pivot arms, each arm having an outside and an inside end, said arms slidably and pivotally mounted at their outside ends in the channel;

(c) hitch means pivotally connected to the inside ends of the pivot arms;

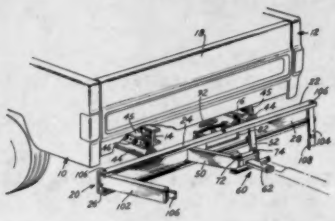
(d) releasable latch means in the base member for engaging and holding the hitch means in fixed position relative to the channel; and

(e) abutment means at the opposite ends of the channel to maintain the slidable pivot arms and hitch means in the channel; and

the improvement comprising in combination:

(f) means for attaching the base member to a vehicle, said means including shock absorbing means said shock absorbing means including:

(i) a cylinder for attachment to the vehicle;



(ii) a rod attached to the base member and projecting into the cylinder;

(iii) a transverse flange plate attached to the end of the rod within the cylinder, said plate being longitudinally slideable in the cylinder; and

(iv) four compression coil springs within the cylinder, said springs having a substantially constant diameter slightly less than the internal diameter of the cylinder, two of said springs having spring constants less than the other two springs, one each of said springs of lesser spring constant and one of said springs of greater spring constant being positioned on opposite sides of the flange plate in opposed relation with each other and intermediate one end of the cylinder and the flange plate, whereby the force absorbed by said spring is a summation of forces dependent upon spring constants.

4,159,834

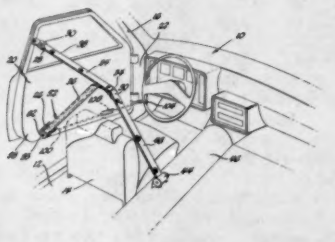
PASSIVE LAP AND SHOULDER BELT SYSTEM

Larry D. Miller, Warren; Laird E. Johnston, Birmingham; John T. Valus, Troy, and Thomas M. Powell, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 25, 1978, Ser. No. 899,717

Int. Cl.[2] B60R *21/02*

U.S. Cl. 280—802 **5 Claims**



1. In combination with a vehicle body having a door movable between open and closed positions laterally adjacent a seat mounted in the occupant compartment of the vehicle body, a

passive belt arrangement for restraining a seated occupant comprising:

a shoulder belt mounted on the door generally adjacent the shoulder of the occupant and having an inboard end;

a lap belt having an outboard end mounted on the door generally adjacent the hip of the occupant and having an inboard end;

a control belt connected to the inboard ends of the lap and shoulder belts;

a seat belt retractor mounted on the vehicle body generally adjacent the inboard hip of the occupant for winding the control belt to establish the inboard lap and shoulder belt ends adjacent the hip of the occupant so that the lap belt is disposed across the lap of the occupant and the shoulder belt is disposed diagonally across the chest of the occupant;

a segmented belt stiffener encased within the lap belt and comprising a plurality of serially stacked elements hingedly abutting one another to normally allow the lap belt to fall limp across the lap of the occupant and having a cable extending therethrough to stiffen the elements into an erect rigid column to lift the lap belt to an inclined vertical position adjacent the door panel when the cable is pulled taut;

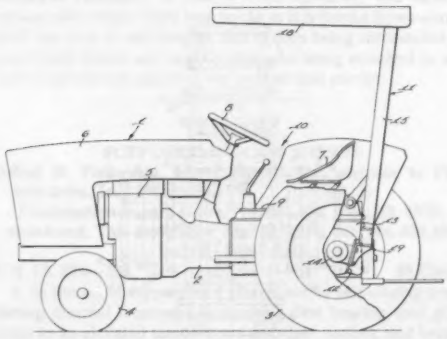
and means for tensioning the cable when the door is open whereby the lap belt is lifted away from the lap of the occupant when the door is opened.

4,159,835

VEHICLE PROTECTIVE FRAME WITH INTERNAL REINFORCING MEMBERS

Ronald J. Leja, Greenfield, and Hugh K. Williams, Milwaukee, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 12, 1977, Ser. No. 859,437
Int. Cl.[2] B62D *25/06*
U.S. Cl. 280—756 **10 Claims**



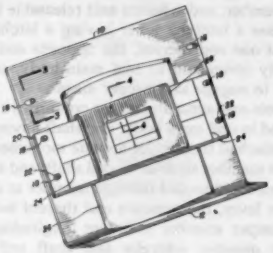
1. A protective frame for a vehicle comprising, a vehicle chassis, tubular uprights including a base fastened to said vehicle chassis, a plurality of reinforcing leaves mounted within each of said tubular uprights fastened at their lower ends at the base of the tubular uprights and having a cross sectional area substantially as great as the cross sectional area of the tubular uprights, each of said reinforcing leaves defining progressively shorter lengths for progressively decreasing the cross sectional area of the reinforcing leaves and the stiffness of said uprights from the base toward the top of said uprights.

4,159,836

BOOK HOLDER AND READING LOCATOR

Hazel Tarr, 819 Paseo Grande, Corona, Calif. 91720

Filed Jan. 3, 1978, Ser. No. 866,535
Int. Cl.[2] B42D *17/00*; G02B *27/02*
U.S. Cl. 281—45 **2 Claims**



1. A device for supporting printed publications with a transparent viewing position comprising:

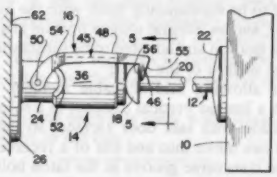
a substantially flat holder body member with an angular base integral with said body or attached thereto having a support leg on the opposed side fixable attached with a plurality of connecting means changing the angle of recline of said leg, also being rotatable from parallel to wide angles to said body and a plurality of rigid equally spaced attaching pins located vertically near the edge of said body to which a retainer plate of optically clear material rectangular in shape with a plurality of bores is slidable affixed to said pins allowing retension of printed matter reclining upon said body, the retainer including a plurality of integral hairlines located vertically and horizontally on or about the surface and a locator member of opaque material slidable attached to said retainer with a longitudinal juncture adapated to cooperate with the upper surface of said retainer including a rectangular opening removed from the material forming a window to view the exposed indica.

4,159,837

COMBINATION DOOR STOP AND LATCHING DEVICE

Mike Y. Morita, Los Angeles, Calif., assignor to Morita Hardware Manufacturing, Inc., Carson, Calif.

Filed Jul. 27, 1978, Ser. No. 928,721
Int. Cl.[2] E05B *3/04*
U.S. Cl. 292—127 **2 Claims**



1. In combination, a door stop and latching device to releasably latch a door in an open position, wherein the device comprises:

a main body adapted to be substantially fixed in relationship to said door;

means for securing said body in a fixed position;

a bumper member slidably mounted to said main body;

a biasing means interposed between said body and said bumper member to force said bumper in an outwardly direction;

means for releasably latching said door in an open position;

means to actuate said releasable-latching means to allow said door to be closed; and

keeper means affixed to said door for engagement with said latching means and said bumper member, wherein said keeper means comprises a mounting plate member; a shaft member extended outwardly from said mounting plate; and an enlarged head member formed on one end of said shaft member; and wherein said releasable latching means comprises a latching lever having a latching tongue located at one end thereof, the opposite end thereof being rotatably connected to said main body, said tongue arranged to engage said keeper means;

and wherein said actuating means comprises a rotatable shaft mounted in said main body, said shaft having said latching lever attached thereto for arcuate movement therewith; a fulcrum member secured to said shaft; and a fulcrum-lever arm connected to said fulcrum member at one end of said fulcrum lever, the opposite end thereof being secured to said bumper member to move longitudinally with said bumper member whereby said shaft and said latching lever are actuated thereby.

4,159,838

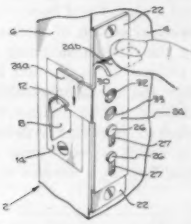
DOOR LATCH BOLT LOCKING DEVICE

Herbert Wilzig, Montebello; Charles J. Schuessler, Covina, and Mark W. Stephens, Tustin, all of Calif., assignors to Mark W. Stephens, Tustin, Calif.

Filed Aug. 29, 1977, Ser. No. 828,436

Int. Cl.[2] E05C *1/04*; E05B *15/00*

U.S. Cl. 292—150 **1 Claim**



1. A door latch bolt locking device for use with a latch bolt having a transverse groove in its top surface to positively prevent the withdrawal of the latch bolt and the opening of the door, comprising:

a slideable member adapted to be disposed flushly with the intersecting edge surface of the door and the inner surface of the door, said member having a first flat portion adapted to be substantially flush with the inner surface of the door, and an integral tongue portion at a right angle to said first portion and adapted to be substantially flush with the edge surface of the door;

means for allowing said slideable member to be moved through a limited vertical distance in a substantially flush relationship with said door surfaces so that said tongue portion can move into and out of a received relationship with the transverse groove in the latch bolt; and

means for positively maintaining said slideable member in the latch bolt-locked position when subjected to vertical forces, said maintaining means comprising a horizontally-extending member fixed to the inner surface of the door and adapted to be received by an opening in the slideable member; and

said slideable member having an opening adapted to receive said horizontally-extending member in a snapping-in action and wherein said slideable member acts to receive and release said horizontally-extending member when said slideable member is pulled outwardly from its substantially flush engagement with the inner surface of the door, said slideable member being made of a material which will provide a biasing return force when the slideable member is pulled outwardly.

4,159,839

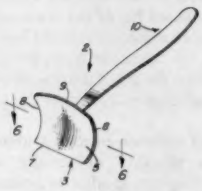
TABLEWARE IMPLEMENT

Eston D. Sigler, 1506 1st St., Lake Charles, La. 70601

Filed Mar. 15, 1978, Ser. No. 886,875

Int. Cl.[2] A47G *21/00*

U.S. Cl. 294—1 R **3 Claims**



1. A tableware implement having a bowl head with a concave front face, and a rear convex face, the bowl head boundary being defined by multiple peripheral edges varyingly contoured to serve as scraping edges, wherein one peripheral edge is flattened to conform to the surface of a plate, and another peripheral edge is arched to conform to the concave rounded inner surface of a bowl, and a handle rigidly attached to the convex face of the bowl head at a substantially central point on the bowl head removed from all peripheral edges, said handle extending in a plane substantially normal to the said point of attachment allowing ready rotation of the bowl head and selective use of the varyingly contoured edges.

4,159,840

LOAD-CARRYING NET FOR SUSPENSION EXTERNALLY OF AIRCRAFT SUCH AS HELICOPTERS

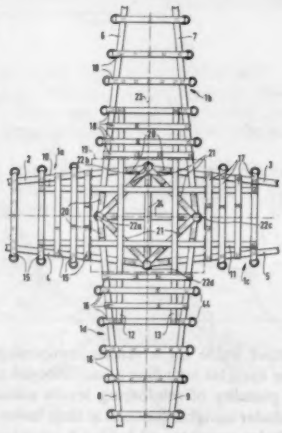
Gerd Fengels, Hagen, Fed. Rep. of Germany, assignor to Brüggemann & Brand KG, Fed. Rep. of Germany

Filed Sep. 29, 1977, Ser. No. 837,882

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644044

Int. Cl.[2] B66C *1/12*

U.S. Cl. 294—77 **16 Claims**



1. A load-carrying net for suspension externally of aircraft such as helicopters, said net comprising: a network of interwoven belts provided with suspension rings for use in suspending said net from suspension tackle of an aircraft, said net having a

central load-supporting portion and opposed pairs of arms which are provided with said suspension rings and which radiate outwardly from said central portion, at least some load-carrying ones of said belts each being secured at their ends in an opposed pair of said arms and extending freely through said central portion so as to make a sliding adjustment in the central portion for load equalization purposes, each arm being additionally connected to the opposite one of said arms by a further belt which is slidable through a number of guide points, said further belts being connected to said arms at the ends thereof adjacent to said suspension rings, and said suspension rings being disposed adjacent to the outer ends of said arms.

4,159,841

BOTTLE CARRIER

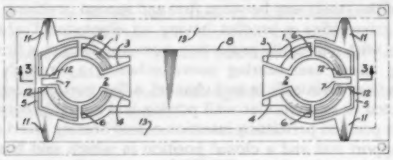
Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 586,328, Jun. 12, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,383

The portion of the term of this patent subsequent to Nov. 11, 1989, has been disclaimed.

Int. Cl.[2] B65D *71/00*

U.S. Cl. 294—87.2 **3 Claims**



1. In a bottle carrier made of relatively rigid flexible plastic material and comprising a plurality of spaced collars for receiving and supporting therein the enlarged neck-shoulders of bottles and a structural member interconnecting said collars, the improvement which comprises at least one flexible tab attached to said carrier at opposite sides thereof and projecting outwardly beyond the confines of said carrier, said tabs being arranged to temporarily support said carrier on spaced tracks of a loading machine above a group of bottles and being of sufficient flexibility to readily bend upwardly and thus to release said carrier from said tracks as it is forced downwardly onto the tops of said bottles, said collars being surrounded by individual frames and said flexible tabs being attached to said individual frames adjacent the ends of said carrier.

4,159,842

SUPPORTING GLASS SHEETS

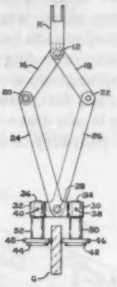
Alfred D. Perkowski, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 556,594, Mar. 10, 1975, abandoned. This application Jan. 22, 1976, Ser. No. 651,387

Int. Cl.[2] B66C *1/48*

U.S. Cl. 294—118 **10 Claims**

1. In the art of supporting a glass sheet by self-closing tongs during thermal treatment comprising first heating said glass sheet to an elevated temperature and then cooling said heated sheet wherein said glass is gripped between opposing glass contacting members of said self-closing tongs that engage the opposite surfaces of said glass sheet and tend to damage said surfaces during said thermal treatment thereof, the improvement comprising engaging said glass sheet surfaces under oxidizing conditions with glass contacting members composed of a tungsten-nickel composite that is essentially free of cobalt and iron to enable said glass sheet to be essentially free of vents, to have minimum marring and minimum weakening in the vicinity of the areas contacted by said glass contacting members as a consequence of said contact during said thermal treatment, said composite being composed essentially of at least 90 percent by weight tungsten and sufficient alloying



metal to render said composite more readily workable than tungsten metal.

4,159,843

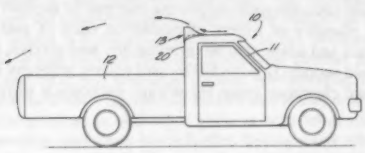
PICKUP TRUCK AIR DEFLECTOR

Milton R. Crossman, 8212 Eth ! Ave., North Hollywood, Calif. 91605

Filed Sep. 28, 1977, Ser. No. 837,605

Int. Cl.[2] B62D *37/00*

U.S. Cl. 296—1 S **3 Claims**



1. A wind deflector for securement to the cab of a truck having an open bed to deflect the airstream beyond the open truck bed, thereby eliminating a retarding force component from acting on the truck, said cab having a top, back wall and side walls, said deflector comprising:

a pair of elongated deflector segments, each segment having a back wall, a contoured top wall integral with said back wall, a sloping front wall, and an end wall, the other end and bottom being open;

said deflector segments being telescoped to one another at their open ends and located on the truck cab top to extend transversly of the cab, each segment back wall being fittingly received onto and intimately contacting the cab back wall, the sloping front wall extending downwardly from the contoured top wall to contact the cab along a continuous line, and the end wall smoothly contacting the side wall; and

means securing the segments back wall, sloping front wall and end walls to the cab.

4,159,844

STORAGE DRAWER FOR MOBILE HOMES

Carl B. Weiner, Bloomfield Hills, Mich., assignor to Metal Awning Components, Inc., Clawson, Mich.

Filed Sep. 22, 1976, Ser. No. 725,498

Int. Cl.[2] B60R *7/00*; B62D *25/20*

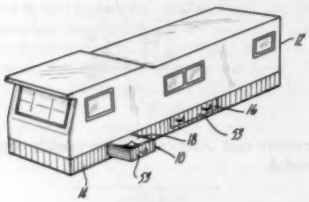
U.S. Cl. 296—37.1 **4 Claims**

3. A storage arrangement in combination with a mobile home structure supported above the ground with a clearance space between a bottom section of said mobile home and the ground, the storage arrangement comprising:

a storage assembly consisting of a rectangular drawer structure having four connected sides and a bottom panel

mounted thereto, wherein said rectangular drawer structure is dimensioned with one side dimension longer than the other, and wherein said means supporting said storage enclosure includes means engageable with both said longer and shorter sides, whereby said drawer may thereby be supported so as to be oriented with either said longer or shorter sides extending into said clearance space;

support means supporting said storage enclosure assembly for movement into and out of said clearance space, including a track groove in said drawer structure side extending entirely about the periphery of said drawer structure and



also including support means adapted to supportingly engage a portion of said groove during said movement in and out of said clearance space, including a pair of support rails and means mounting said pair of support rails in said clearance space including a plurality of concrete pads supported on the ground and clamping means affixed to said concrete pads supporting said pair of support rails and a plurality of rollers supported on each of said support rails and adapted to be received into said groove, whereby said support is provided by said rollers, whereby access to said clearance space for storage purposes is provided.

4,159,845

AIRSTREAM DEFLECTOR FOR MOTOR VEHICLES

Glenn N. Bratsberg, P.O. Box 723, Lewiston, Id. 83501

Filed Mar. 22, 1978, Ser. No. 889,007

Int. Cl.[2] B60J *1/20*

U.S. Cl. 296—95 R **1 Claim**

1. An airstream deflector, comprising, in combination, a transverse extending baffle, secured in a frame, supported at a front of an automotive vehicle, said baffle deflecting air upwardly as said vehicle travels forward; and said deflector additionally including a transverse extending vertical plate in front of a rearwardly pivotable louver, forming a throat therebetween; an airflow actuator automatically pivoting said louver rearwardly by air pressure within said throat, said actuator including a compression coil spring between said louver and a stationary positioned, collar-like member; and said airstream deflector being made in right and left-side sections, which at their outer ends are rearwardly inclined, said sections including a plurality of parallel, spaced-apart, vertical baffles extending between said transverse baffle and into said throat, said parallel baffles being all parallel to a forward-rearward direction of said vehicle.

4,159,846

TABLET ARM FOR WIRE ROD CHAIR

Thomas H. Tolleson, Green Bay, Wis., assignor to Krueger Metal Products, Inc., Green Bay, Wis.

Filed Jun. 30, 1978, Ser. No. 920,916

Int. Cl.[2] A47B *39/00*; E05D *11/04*

U.S. Cl. 297—162 **3 Claims**

1. In a tablet arm attachment for a chair including a tablet arm, support rod and depending struts for securing the attachment to a chair, the improvement comprising means to clamp the tablet arm to said support rod to afford rotational movement of the tablet arm between first and second positions, said means comprising a bracket having an elongated U-shaped channel with outwardly projecting mounting flanges, a flexible bearing insert, said bearing insert including a circular wall portion sized to interfit in said channel, a flap portion hingedly connected to said circular wall portion and movable between an open position permitting insertion of said bearing insert over said support rod and a closed position in which said bearing portion encapsulates said support rod and said flap being flush with said tablet arm when said bracket is secured to said tablet arm.

4,159,847

SEAT FOR A MOTOR VEHICLE OR THE LIKE

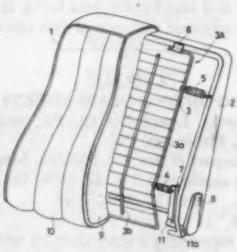
Tomiji Arai, Tokorozawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed May 27, 1977, Ser. No. 801,396

Claims priority, application Japan, Jun. 7, 1976, 51/73341[U]

Int. Cl.[2] A47C *3/00*

U.S. Cl. 297—284 **7 Claims**



1. A seat backrest comprising:

a rigid main frame supporting a contourable cushion portion having a flexible protective cover and a layer of padding interposed between said cover and said frame;

a second frame hingedly mounted on said main frame proximate the upper edge of said main frame, said second frame being disposed to abut said layer of padding and disposed so that the pendulous motion thereof between first and second positions varies the contour of said protective cover and layer of padding;

a crank rotatably mounted on said main frame proximate the

base of said main frame, said crank being operatively connected to said second frame so that rotation of said crank produces said pendulous motion of said second frame and vice versa;

first biasing means for biasing said crank to rotate in a direction for urging said second frame via said operative connection therebetween toward said first position and against said layer of padding; and

means for disengagably locking said crank in a desired angular position with respect to said main frame so that said second frame is held in a desired position between said first second positions, said means for disengagably locking said crank comprising;

a lever connected to said crank and integrally movable therewith;

a gear fixed to said frame, said gear having a toothed portion and a recessed portion;

a manually operable lock lever mounted to said lever so as to be pivotal between first and second positions relative to said lever and having a portion arranged to abut said lever when said lock lever assumes said second position, said lock lever being formed with a first pawl and a second pawl, said first pawl lockingly engaging with said toothed portion when said lock lever assumes said first position thereof so that said lever is locked relative to said main frame and said second pawl engaging said recessed portion when said lock lever assumes said second position thereof to permit said crank to rotate between first and second angular positions whereby said second frame can pendulously move between said first and second positions thereof; and

second biasing means for biasing said lock lever toward said second position thereof.

4,159,848

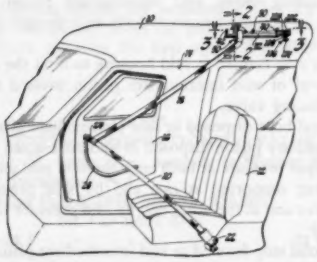
LINEAR LOCKING SEAT BELT RETRACTOR

David F. Manz, Bloomfield Hills; Clarence C. Irwin, and Theodore M. Salamon, both of Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 12, 1978, Ser. No. 914,394

Int. Cl.[2] A62B *35/00*; B60R *21/10*

U.S. Cl. 297—474 **3 Claims**



1. A seat belt locking and retracting mechanism comprising:

a longitudinally extending track member;

a belt carriage member mounted on the track member for movement therealong and having a belt attached thereto;

a locking means mounted on one of the members and actuatable to a locked position engaging the other member to lock the carriage member against movement along the track member;

an actuating element extending longitudinally adjacent the track member along the path of carriage movement and being selectively movable relative thereto to actuate the locking means;

and an inertia sensing means operatively engageable with the actuating element for moving the actuating element whereby the locking means is actuated by the actuating element in response to a sensed acceleration condition to lock the carriage member against movement along the track member.

4,159,849

HOLDING DEVICE FOR A CHAIN

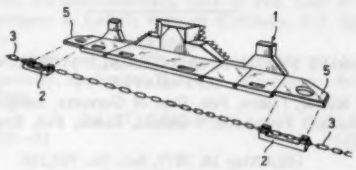
Friedhelm Rehbein, Menden-Oesbern, Fed. Rep. of Germany, assignor to Fa. August Thiele, Iserlohn, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,128

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 2643264

Int. Cl.[2] E21C *29/06*

U.S. Cl. 299—34 **20 Claims**



1. A holding device for a chain, particularly a chain associated with a coal cutter and having chain members located in two mutually transverse planes, the holding device comprising a one-piece chain block mountable on a support and having two portions which are of one piece with and immovable relative to each other, said chain block having a U-shaped recess formed in said relatively immovable two portions and dimensioned for receiving one end section of one of the chain members which is located in one of the planes without displacement of said two portions relative to one another and so that said end section is embraced by said two portions in said one plane at both sides of said end section and is also embraced by said two portions in said other plane at both other sides of said end section, said chain block further having a slot which is bounded by said relatively immovable two portions and located in the other of said planes and which is dimensioned for receiving the other chain member which is located in the other of said planes also without displacement of said two portions relative to one another.

4,159,850

MINERAL MINING INSTALLATION WITH FACE END WINNING

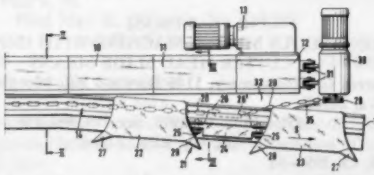
Armin Lobbe, Oberaden, and Bernd Steinkuhl, Lunen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,675

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704809

Int. Cl.[2] E21C *27/35*

U.S. Cl. 299—34 **10 Claims**



1. In a mineral mining installation for winning material in a longwall working, the installation comprising a conveyor, a guide provided at the face-side of the conveyor, a drive frame at each end of the conveyor, a plough movable along the guide, and a plough driving chain passing around a pair of end sprockets, each end sprocket being associated with a respective

one of the drive frames, the improvement comprising constituting the plough by two longitudinally spaced plough bodies each of which is provided with cutter means, the two plough bodies being connected together by means of an intermediate member pivotally connected to each of the plough bodies, the intermediate member being connected to the two ends of the plough driving chain, and the plough being of sufficient length to enable material to be won at least as far as each end sprocket, wherein the guide defines a pair of guide channels for the two runs of the plough driving chain, and wherein the guide is off-set away from the conveyor, and towards the longwall face, in the region of each of the drive frames whereby a gap is formed between each drive frame and the adjacent portion of the guide, each of said gaps constituting an access area for the plough driving chain to pass between the associated end sprocket and the guide channels.

4,159,851

DRIVE FRAME AND ASSEMBLY FOR MINING APPARATUS

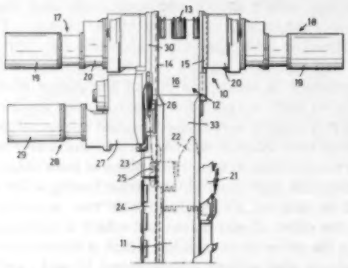
Wulff Rösler, Lunen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 797,215

Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623066

Int. Cl.² E21C *29/16*

U.S. Cl. 299—43 **14 Claims**



1. A drive frame for the drive assembly of a mining installation constituted by a winning machine and a conveyor, comprising; a pair of side plates for said drive frame, a connector fastened to one of the side plates, the connector including means for the connection of respective drive units for the conveyor and the winning machine, the connector having a respective mounting plate for each of the drive units and each of the mounting plates being connected to one another in a tension-proof manner, an annular collar extending into an aperture in said one side plate to support and align the connector, and coupling means for locking the connector to said one side plate in a non-rotational manner, the coupling means being spaced from the annular collar.

4,159,852

CONTINUOUS MINING MACHINE WITH IMPROVED CUTTER HEAD SLIDE MEANS

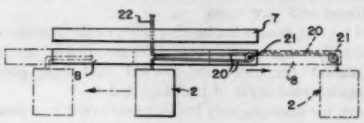
Warren G. Montgomery, 1146 Berwood Rd., Morgantown, W. Va. 26505

Filed Mar. 14, 1978, Ser. No. 886,478

Int. Cl.² E21C *31/06*

U.S. Cl. 299—56 **4 Claims**

1. A continuous mining machine comprising a carrier, a support bar mounted on said carrier, a feed bar substantially coextensive in length with and slidably mounted on said support bar to move along the longitudinal axis thereof, a cutter head slidably mounted on said feed bar to move along the longitudinal axis thereof, double-acting drive means for sliding said feed bar in alternate directions on said support bar, a sheave rotatably mounted on said feed bar and a cable extending over said sheave having one end fixed to said cutter head



and the other end fixed to said support bar whereby when said drive means slides said feed bar with respect to said support bar, said cutter head will slide with respect to said feed bar.

4,159,853

PRESSURE CONTROL UNIT FOR A VEHICULAR HYDRAULIC BRAKING SYSTEM

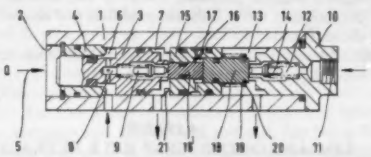
Heinrich Oberthuer, Offenbachrumpenheim; Jochen Burgdorf, Offenbach, and Hans-Henning Luepertz, Darmstadt, all of Fed. Rep. of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed Jul. 8, 1977, Ser. No. 813,929

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637278

Int. Cl.² B60T *13/00*

U.S. Cl. 303—6 C **5 Claims**



1. An improvement to a pressure-control unit for a vehicular hydraulic braking system including a housing having an axis incorporating at one end thereof a pressure-reducing valve coaxial of said axis and at the other end thereof a pressure-limiting valve coaxial of said axis, and an intermediate piston disposed between said pressure-reducing valve and said pressure limiting valve, said intermediate piston being acted thereon by output pressure at both ends thereof; said improvement comprising:

a first stop formed in said housing to limit the displacement travel of said intermediate piston toward said pressure reducing valve,

an axial bore disposed in said intermediate piston,

an auxiliary piston disposed in said bore acted upon by said output pressure at both ends thereof, said auxiliary piston being supported at one end by said pressure-reducing valve and at the other end by said pressure-limiting valve, and

a second stop formed in said intermediate piston to limit the displacement travel of said auxiliary piston in said intermediate piston in the direction of said pressure-reducing valve.

4,159,854

BRAKE SYSTEM WITH PILOT ACTUATION

Wayne A. Peterson, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 8, 1978, Ser. No. 903,462

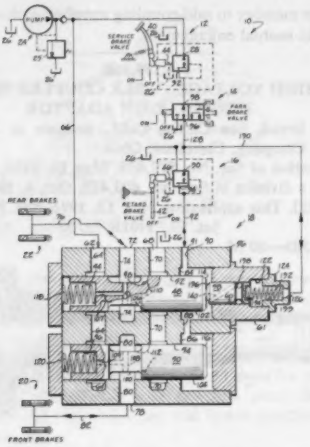
Int. Cl.² B60T *8/26*

U.S. Cl. 303—6 M **33 Claims**

1. A brake system for a vehicle, having a first set of brakes and a second set of brakes and a source of pressurized fluid and a sump, comprising:

a valve body;

a first spool slidingly disposed in a first bore defined by the valve body;
a second spool slidingly disposed in a second bore defined by the valve body;
a first communication means for placing the source of fluid in fluid communication with the first and second bores;
a second communication means for placing the sump in fluid communication with the first and second bores;
a third communication means for placing the first bore in fluid communication with the first set of brakes;
a fourth communication means for placing the second bore in fluid communication with the second set of brakes;



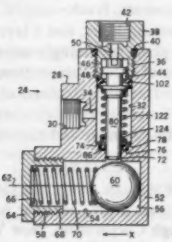
first positioning means for positioning the first spool in the first bore to provide communication selectively between the source fluid and the first set of brakes and between the sump and the first set of brakes, and for positioning the second spool in the second bore to provide communication selectively between the source of fluid and the second set of brakes and between the sump and the second set of brakes;
second positioning means for positioning the first spool relative to the second spool for providing a variance in braking force between the first and the second set of brakes.

4,159,855

LOAD SENSING PROPORTIONING VALVE

Edward J. Falk, St. Louis, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Feb. 3, 1978, Ser. No. 874,801
Int. Cl.[2] B60T *8/14*
U.S. Cl. 303—24 F **21 Claims**



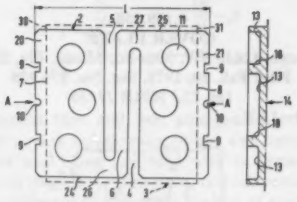
1. A valve for a vehicle hydraulic brake system comprising:
(a) an inlet and an outlet;
(b) a valve member interposed between said inlet and said outlet, said valve member being movable between an ope position and a closed position for controlling the pressure relationship between said inlet and said outlet; and
(c) means operative when only the load carried by the vehicle exceeds a single preselected weight level for disabling said valve member in its open position during the entire range of inlet pressure so that the pressure at said outlet will be equal to the pressure at said inlet for all levels of inlet pressure.

4,159,856

RUNNING PAD FOR AN ENDLESS TRACK

Ludwig Pietzsch, Rittnertstrasse 36, D-7500 Karkruke, Fed. Rep. of Germany; Harald Kauer, Ettlingen, and Rudolf Hartmann, Karlsbad-Auerbach, both of Fed. Rep. of Germany, assignor to Ludwig Pietzsch Karkruke, Fed. Rep. of Germany

Filed Dec. 12, 1977, Ser. No. 859,814
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657906
Int. Cl.[2] B62D *55/28*
U.S. Cl. 305—51 **5 Claims**



1. A running pad for an endless track for vehicles and the like, comprising
(a) a resilient running pad body (3); and
(b) a unitary resilient generally planar plate member (2) embedded within and extending horizontally completely through said running pad body, a pair of opposite ends (20,21) of said plate member extending outwardly beyond said pad body, said plate member containing at least one zone of weakness for permitting elastic compressional deformation of said plate inwardly in the direction between said opposite ends, whereby the plate, when in the compressed condition, may be mounted between a pair of opposed longitudinally spaced recesses (13) contained on the endless track, so that upon subsequent expansion of the plate, the running pad is mounted on the track.

4,159,857

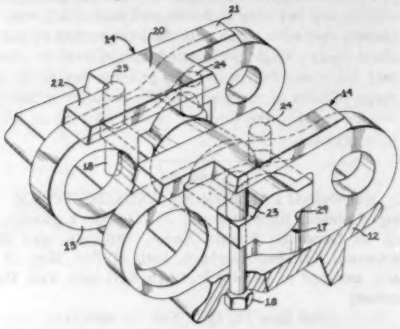
TRACK ASSEMBLY WITH MID-PITCH DRIVE LUG AND REPLACEABLE RAIL

Robert J. Purcell, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 30, 1978, Ser. No. 910,251
Int. Cl.[2] B62D *55/28*
U.S. Cl. 305—54 **12 Claims**

1. A track assembly comprising:
a pair of laterally spaced links,
a track shoe disposed on an underside of said pair of links,
a rail segment disposed on an upper side of each link of said pair of links,
a drive lug disposed intermediate the ends of said links and further disposed in transverse relationship relative therebetween, and
fastening means releasably securing said track shoe and drive lug to each of said links and to the rail segment disposed thereon,
wherein said fastening means comprises a plurality of fasten-

ers each extending sequentially through said track shoe and said drive lug and releasably secured to said rail segment whereby each said link is clamped between said rail segment and said track shoe.



4,159,858

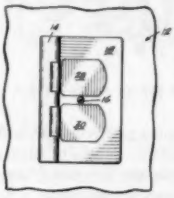
COVER PLATE

Juan E. Toraya, 12433 SW. 30th St., Miami, Fla. 33175

Filed Feb. 10, 1978, Ser. No. 876,925

Int. Cl.[2] H01R *11/30*

U.S. Cl. 339—12 R **5 Claims**



1. A safety lock escutcheon plate adapted to be positioned in covering relation of an energized electrical receptacle, said plate having an opening and a cap in covering relation of the opening, pivot means connecting the cover to the escutcheon plate, said plate having a socket adjacent the cap and keeper means in the socket and in blocking relation of pivotal movement of the cap, said keeper means comprising a ferrous metal member and a magnet means for moving the ferrous metal member into and out of blocking relation of pivotal movement for gaining access through the opening by using the magnetic member as a key.

4,159,859

CRADLE TYPE GROUND LUG FOR CONDUIT

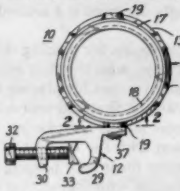
Sami Shemtov, Central Islip, N.Y., assignor to Gould Inc., East Farmingdale, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,096

Int. Cl.[2] H01R *3/06*

U.S. Cl. 339—14 L **11 Claims**

1. An electrical cable coupling device comprising a metal coupling member electrically and mechanically connectable to a member of an electrical installation and including a first coupling section, a wire connnector member including a second coupling section coaxially engageable with said first coupling section in a plurality of discrete preselected, incrementally separated relatively angularly related positions, one of said coupling sections including a plurality of peripherally spaced radially offset first longitudinally extending abutment faces and the other of said coupling sections including at least one radially offset second abutment face whereby when said coupling sections are in engaged position said second abutment face engages a first abutment face to postively restrict said wire connector member against axial rotation from a preselected angular position and means for releasably locking said wire connector member to said coupling member with said coupling sections in mutual engagement.



4,159,860

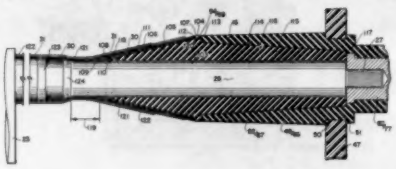
HIGH VOLTAGE CABLE COUPLER WITH TERMINATION ADAPTOR

Roy M. Broad, San Carlos, Calif., assignor to The Scott & Fetzer Company, Cleveland, Ohio

Continuation of Ser. No. 577,439, May 14, 1975, abandoned, which is a division of Ser. No. 403,455, Oct. 4, 1973, Pat. No. 3,932,933. This application Nov. 17, 1976, Ser. No. 743,054

Int. Cl.[2] H01R *13/52*

U.S. Cl. 339—60 M **25 Claims**



1. A cable termination adaptor comprising in combination an insulating elastomeric tubular body defining a bore for the insertion of an insulated electrical conductor and having on one end portion thereof a frusto-conical outer surface with the smallest diametrical extent of said frusto-conical surface terminating at an outside end of said body; an annular flange formed on said body at the largest diametrical extent of said frusto-conical surface; a semiconductive elastomeric frusto-conical layer integrally bonded on said surface and having a large and a small annular end edge with the larger annular edge thereof contiguous with a perimetric edge of said flange and the smaller annular edge thereof flared to a point ending beyond said outside end of said body; an electric transmission cable having a covering layer containing conductive shielding properties which overlies an insulative covered conductor with a portion of said conductive shielding stripped from the terminal end of said cable leaving an exposed terminal end of insulative covered conductor; said exposed terminal end received in said bore with a portion of said insulative covering being permissibly exposed between said flared smaller annular edge of said semiconductive elastomeric frusto-conical layer and the terminus of said cable covering layer; and a layer of shielding material having metallic properties snugly covering without voids over the combination of a terminus portion of said cable covering layer and said permissibly exposed cable insulation layer and a portion of said semiconductive elastomeric frusto-conical layer at the smaller annular end thereof without gaps.

4,159,861

ZERO INSERTION FORCE CONNECTOR

John W. Anhalt, Orange, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,031

Int. Cl.[2] H01R *13/62;* **H05K** *1/12*

U.S. Cl. 339—75 MP **21 Claims**

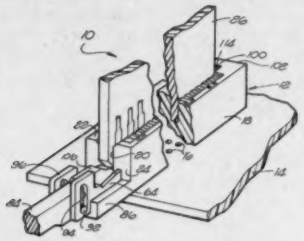
1. A zero insertion force electrical connector comprising: an elongated insulative housing having a row of contacts

therein, said housing having an opening to the top for receiving therein conductors on an electrical component;

each said contact having a mounting portion and a spring contacting portion extending upwardly from said mounting portion at an angle in one direction toward a vertical plane passing through said opening;

an arm on the spring contacting portion of each said contact extending downwardly at an angle in a direction away from said vertical plane;

means for retracting said contacting portions of said contacts away from said vertical plane, said retracting means comprising contact shifting means and cam actuator means;



said contact shifting means being disposed between said spring contacting portions and said arms of said contacts and movable vertically *relative to said arms* between a lower position and an upper position;

said contact shifting means embodying cam surface means *slidably* engaging *the inside surfaces of* said arms for retracting said contacting portions of said contacts away from said vertical plane when moved from said lower position to said upper position; and

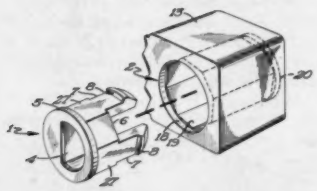
said cam actuator means being operable to move said contact shifting means from said lower position to said upper position.

4,159,862

REMOVABLE FEMALE POLARIZING GUIDE FOR ELECTRICAL CONNECTORS

Gordon W. Funck, Crystal, and Robert J. Melcher, Edina, both of Minn., assignors to Fabri-Tek Incorporated, Minneapolis, Minn.

Filed Dec. 12, 1977, Ser. No. 859,382
Int. Cl.² H01R *13/64*
U.S. Cl. 339—186 M **13 Claims**



1. A removable female polarizing guide for separable electrical connectors, comprising

(a) a connector body having a bore with axially aligned flange, body and shoulder apertures, the body aperture having a smaller diameter than either the flange or shoulder apertures with the body aperture longitudinally located between the flange and the shoulder aperture, the body aperture having a polygonal shape; and

(b) a bushing matingly engaged with the bore having

(i) a flange;

(ii) a polygonal body section axially aligned with the flange having a diameter smaller than that of the flange and having a nonround keyway extending longitudinally through the body and through the flange; and

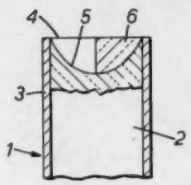
(iii) at least one finger extending longitudinally from a side of the body having a shoulder which extends radially from the finger in a direction away from a longitudinal axis through the bushing, said flange and shoulder being received in said flange and shoulder aperatures, respectively.

4,159,863

COUPLING OF OPTICAL GLASS FIBRES

William J. Stewart, Towcester, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Oct. 12, 1977, Ser. No. 841,381
Claims priority, application United Kingdom, Oct. 13, 1976, 42483/76
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96.18 **7 Claims**



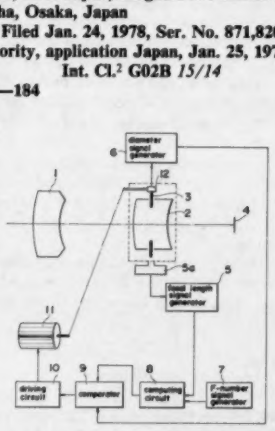
1. An optical fibre and lens arrangement comprising an optical fibre having a chemically etched well formed in an end thereof, said well being provided with an optical lens, said optical lens having a convex surface, said convex surface being in intimate contact with the entire surface of said well.

4,159,864

APERTURE STOP CONTROL DEVICE FOR A ZOOM LENS SYSTEM

Mitsuo Yasukuni; Takashi Iida, both of Sakai, and Hiroshi Kiten, Mino, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 24, 1978, Ser. No. 871,820
Claims priority, application Japan, Jan. 25, 1977, 52/7444
Int. Cl.² G02B *15/14*
U.S. Cl. 350—184 **10 Claims**



8. An aperture stop control device for a zoom lens system comprising;

an aperture stop means capable of being electrically controlled;

means for electrically generating an F number signal;

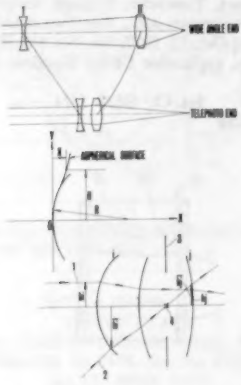
means for electrically generating a focal length signal; and

means for electrically computing the F number signal with the focal length signal to generate an electrical signal for controlling the aperture stop means despite any variation in the focal length of the zoom lens system.

4,159,865
ZOOM LENS SYSTEM

Naoto Kawamura, Inagi, and Akira Tajima, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 715,496, Aug. 18, 1976, abandoned.
This application May 16, 1978, Ser. No. 906,762
Claims priority, application Japan, Aug. 22, 1975, 50-101860
Int. Cl.[2] G02B *15/14*
U.S. Cl. 350—184 5 Claims



1. A zoom lens comprising, from front to rear in the direction in which light enters said zoom lens from an object,

a first lens component having negative focal length and having a plurality of elements moving together during zooming between a wide angle position and a telephoto position, said lens component elements including a front negative meniscus lens which is convex to the front and whose diameter is the longest in said zoom lens, and a rearmost positive lens, one of said lens component elements having an aspherical surface for removing barrel distortion in the wide angle position, said aspherical surface being located to have an aspherical influence on a main light ray off the optical axis in the wide angle position without having an aspherical influence on the main light ray in the telephoto position; and

a second lens component of positive focal length having a plurality of elements moving together during zooming between the wide angle and telephoto positions, said second lens component elements including a diaphragm of said zoom lens incorporated therein and including at least one positive lens, one double concave lens and at least one positive lens consecutively arranged on the image side of said diaphragm,

said first and said second lens components defining therebetween an air space which is variable and largest at the wide angle position and narrowest in the telephoto position.

4,159,866
SETTING OR ADJUSTING MEANS FOR REARVIEW MIRRORS OF MOTOR VEHICLES OR THE LIKE

Erich Wunsch; Udo Wunsch, and Eckart Wunsch, all of Im Hofrain 12, 7141 Schwieberdingen, Fed. Rep. of Germany

Filed Sep. 22, 1976, Ser. No. 725,667
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1975, 2543512; Oct. 15, 1975, 2546091; Dec. 23, 1975, 2558457; Mar. 4, 1976, 2608919; Aug. 25, 1976, 2638143
Int. Cl.[2] G02B *5/08*
U.S. Cl. 350—289 10 Claims

1. A setting and adjusting means for rearview mirrors mounted on a vehicle body comprising

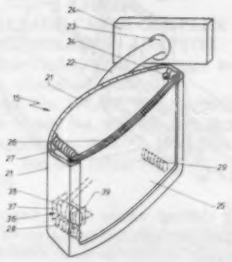
a mirror housing adapted to be mounted on the vehicle body,

a mirror plate having a rear surface and a front reflecting surface,

means for adjustably mounting said mirror plate in said housing for pivotal tilting simultaneously superimposed both about a substantially vertical axis and a substantially horizontal axis,

stop means mounted in said housing in a path of pivoting of said mirror plate for directly abuttingly limiting the pivoting of said mirror plate and for defining a rest position of the latter thereagainst,

controllable adjusting means upon actuation and release thereof, respectively, for pivotally tilting said mirror plate simultaneously superimposed about both said horizontal and vertical axes into predetermined lateral and vertical positions and against said stop means, respectively,



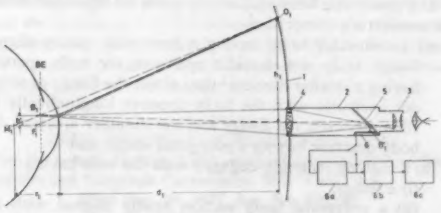
said mounting means for adjustably mounting said mirror plate being disposed at an off-center edge region of said mirror housing and of said mirror plate,

said adjusting means for operatively pivoting said mirror plate about said mounting means, said adjusting means for engaging said mirror plate at another edge region of said mirror plate substantially opposite said mounting means, said another edge region being off-center in a direction relative to both said vertical and said horizontal axes, such that upon actuation of said adjusting means said mirror plate pivots about said mounting means simultaneously about said substantially vertical and horizontal axes out of said rest position away from said stop means.

4,159,867
DEVICE AND METHOD FOR MEASURING THE CURVATURE OF THE CORNEA

Manfred Achatz, Heusenstamm; Rasmus Beck, Neu-Isenburg, and Werner Bockelmann, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Battelle-Institute e. V., Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 9, 1977, Ser. No. 831,996
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1976, 2641004
Int. Cl.[2] A61B *3/10, 3/00*
U.S. Cl. 351—6 13 Claims



1. A device for measuring the curvature of a cornea comprising:

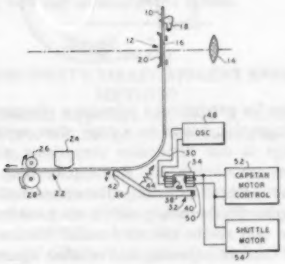
(a) a continuous surface plate positioned in front of the cornea to be measured;
(b) a telescope extending through said continuous surface plate having its optical axis located at the center of said surface;
(c) means to generate a plurality of object points on said surface plate, the object points forming image points on the image plane of the cornea;
(d) reflecting means in said telescope for reflecting incident light from the image plane of the cornea;
(e) detecting and measuring means for detecting the light reflected by said reflecting means and for measuring the position of the image points with respect to the optical axis to thereby determine the curvature of the cornea.

4,159,868

FILM LOOP FORMING DEVICE

Kotaro Sano, Kodaira, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.), Higashimurayama, Japan

Filed Jul. 3, 1978, Ser. No. 921,671
Claims priority, application Japan, Jul. 4, 1977, 52-87596[U]
Int. Cl.² G03B *31/00*
U.S. Cl. 352—14 **8 Claims**



1. In a camera for recording sound and images wherein the film is advanced intermittently past an image recording station by a first drive means and advanced at a constant speed past a sound recording station by a second drive means, and wherein a detector senses the size of a film loop developed between the image recording station and the sound recording station, a film loop size control, comprising:

control means responsive to the detector sensing a slack film loop when the film is stationary for actuating only the second drive means to reduce the slack, and responsive to the detector sensing an absence of slack in the film for de-actuating the second drive means; and

switch means adapted to be actuated when the film slack has been reduced for actuating both the first and second drive means for advancing the film past the image recording station and the sound recording station for recording of images and sound on the film,

whereby synchronism is maintained between the film at the image recording station and the film at the sound recording station by the removal of slack in the film loop prior to advancing the film for the recording of images thereon.

4,159,869

CURSOR FOR USE IN MICROFILM READER

Yutaka Watanabe, Hon, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 26, 1977, Ser. No. 836,326
Claims priority, application Japan, Oct. 1, 1976, 51-133182[U]
Int. Cl.² G03B *21/00*; B43L *13/04*
U.S. Cl. 353—122 **6 Claims**

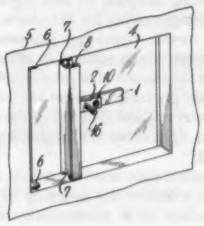
1. A cursor mechanism for use in a microfilm reader having a vertically extending rectangular projection screen and a rectangular frame surrounding said screen, comprising:

a cursor member extending laterally across and proximate to and parallel to the plane of said screen and having a longitudinal opening proximate an end thereof;

a support member swingably mounting said cursor member by means of a pivot and having a bore therein;

a cursor pole provided along one side of said screen frame for vertically slidably supporting said support member; and

an angle adjusting means for adjusting the angle of said cursor member;



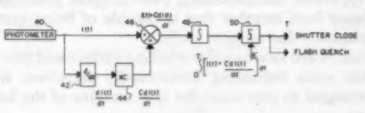
wherein said angle adjusting means comprises, a pivot member rotatably projecting through said support member bore, a cam member engaging said longitudinal opening and affixed to one end of said pivot member, a knob affixed to the other end of said pivot member for turning said cam member and adjusting the angle of said cursor member and means including a friction cushion and a loading spring entrapped between the confronting faces of said knob and said support member for frictionally preventing the rotation of said cam member by said cursor member under the influence of gravity while permitting the manual rotation of said knob to turn said cam member and adjust the angle of said cursor member.

4,159,870

EXPOSURE CONTROL APPARATUS INCLUDING GENERAL PURPOSE LAG COMPENSATION

George P. Corey, and Paul Haas, Jr., both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 21, 1978, Ser. No. 879,525
Int. Cl.² G03B *7/08, 15/05*
U.S. Cl. 354—32 **8 Claims**



1. In a photographic camera adapted to expose a photosensitive recording medium to scene light whose intensity either substantially varies or remains substantially constant during the exposure, improved exposure control apparatus comprising:

(a) means for initiating exposure of the photosensitive medium;
(b) means for receiving photoflash apparatus;
(c) means coupled to said photoflash apparatus receiving means and said exposure initiating means for operating received photoflash apparatus to produce light of substantially varying intensity in timed relation to operation of said exposure initiating means;
(d) means responsive to an exposure termination signal for terminating the exposure;
(e) light-responsive timing means, coupled to said exposure

terminating means, adapted when actuated for generating a photosignal proportional to scene light and for generating the exposure termination signal a time interval after being actuated, the time interval being related to the time integral of said photosignal, and thereby to the time integral of said scene light, said exposure terminating means exhibiting a characteristic time delay between the generation of the exposure termination signal and actual termination of the exposure;

(f) first means, coupled to said light-responsive timing means, for compensating for the characteristic time delay including means for actuating said timing means a predetermined time prior to initiation of exposure; and

(g) second means, coupled to said light-responsive timing means, for compensating for the characteristic time delay, said second means, operating independently of whether photofalsh apparatus is utilized to effect the exposure, for adjusting the time interval in proportion to the time rate of change of said photosignal from the beginning to the end of the time interval, and thereby to the time rate of change of said scene light from the beginning to the end of the time interval,

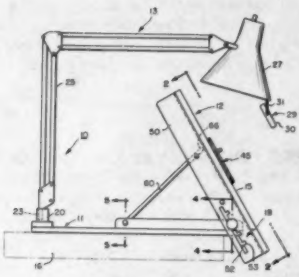
whereby the adjusted time interval results in substantially the desired exposure whether the intensity of the scene light is substantially constant or is substantially varying during the time interval.

4,159,871

PHOTOGRAPHIC RETOUCHING APPARATUS

Joseph A. Arnone, 258 Briggs St., Syracuse, N.Y. 13208

Filed Aug. 9, 1978, Ser. No. 932,130
Int. Cl.[2] G03D *15/00*
U.S. Cl. 354—350 **9 Claims**



1. Apparatus for retouching photographic prints including

a planar base member that is capable of being seated upon relatively flat support surface,

a work board having a flat working surface and two opposite side walls depending downwardly therefrom which are arranged to pass over the side margins of the base member,

a slide formed in each of said opposite side walls of the base that includes an elongated slot passing through said side wall that is generally parallel to the working surface of the board and having a plurality of spaced-apart notches formed in the upper wall thereof,

a pair of hinge pins supported in the side margins of the base member and being arranged so that one of said pins passes outwardly through each of the adjacently positioned slides whereby the board may be selectively located in said notches and simultaneously rotated about said hinge pins to adjust both its elevation and angular positioning,

locking means associated with said hinge pins for securing said board in a selected position,

a vibratory disc centrally mounted in said board with the top surface of said disc being co-planar with the working surface of the board whereby a photographic print having a surface area greater than the surface area of the disc can be supported in a flat condition upon the working surface of the board, said disc being supported in noncontiguous relation with said board, and

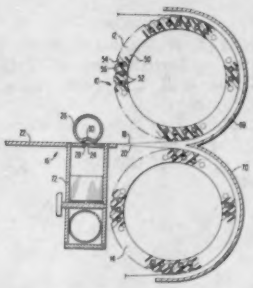
vibrating means operatively associated with the vibratory disc for vibrating the disc at a predetermined frequency.

4,159,872

OPTICAL DISTORTION DEVICE

Paul A. Klann, P.O. Box 2398, Waynesboro, Va. 22980

Filed Nov. 29, 1977, Ser. No. 855,640
Int. Cl.[2] G03B *27/20*
U.S. Cl. 355—91 **11 Claims**



1. A device for producing a print on a photosensitive sheet from a photographic image on a copy sheet with a predetermined change in one dimension comprising a frame, light source means mounted in said frame, a housing surrounding said light source means including a flat upper surface having an elongated light slit therein, positive air pressure means disposed above said slit in spaced parallel relation thereto for holding said sheet in superimposed relation against said upper surface as said sheet passed over said light slit, first and second roller means rotatably mounted in said frame with the axis thereof disposed parallel to each other and said elongated light slit and disposed in a plane perpendicular to the plane of said flat surface, each of said rollers having vacuum means for holding a respective one of said sheets to the surface of each roller and variable speed driving means for rotating said rollers to pull said sheets passed said light slit at the desired relative speed.

4,159,873

RANGEFINDER AND DIGITAL SINGLE SHOT CIRCUIT

Robert P. Farnsworth, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 27, 1977, Ser. No. 836,937
Int. Cl.[2] G01C *3/08*; H03K *3/30, 3/10*
U.S. Cl. 356—5 **11 Claims**

1. A ranging system for providing the range of remote targets comprising:

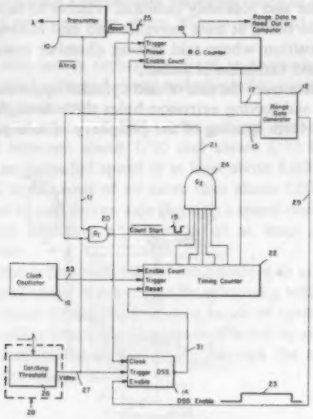
(a) transmitting means for transmitting energy pulses to remote targets;

(b) detector means for receiving portions of the energy pulse reflected by the remote targets and for developing video pulses;

(c) first and second counters, said second counter coupled to said first counter for being controlled by said first counter when said first counter counts to a predetermined value; and

(d) digital single shot means responsive to the video pulses from said detecting means for applying reset pulses to said first counter, said digital single shot means including an enabling terminal further comprising first gating means

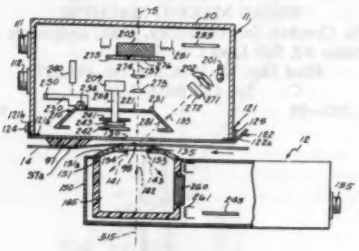
coupled to said first and second counters and to said enabling terminal and responsive to predetermined counts of said counters for developing a pulse for enabling and disabling said digital single shot means.



4,159,874
OPTICAL PROPERTY MEASUREMENT SYSTEM AND METHOD

Leonard R. Dearth, Appleton, and Fred P. Lodzinski, Port Edwards, both of Wis., assignors to Nekoosa Papers Inc., Port Edwards, Wis.

Continuation-in-part of Ser. No. 438,993, Feb. 4, 1974, Pat. No. 3,992,190. This application Jul. 19, 1976, Ser. No. 706,827
The portion of the term of this patent subsequent to Nov. 16, 1993, has been disclaimed.
Int. Cl.² G01N *21/53, 21/30;* G01J *3/50*
U.S. Cl. 356—73 **45 Claims**

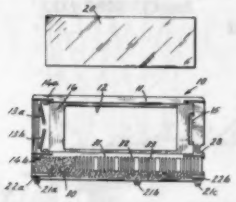


16. Apparatus for measuring an optical property of single thickness sheet material, comprising an optical measuring system including light source means, sheet receiving means for receiving light energy therefrom, photometric sensor means for receiving light energy from the sheet receiving means for providing respective reflectance and transmittance output signal components as a function of respective reflectance and transmittance parameters of a single thickness sheet material at the sheet receiving means, and further means operable in conjunction with said photometric sensor means for providing a quantitative output based on the reflectance and transmittance output signal components and in accordance with an optical measurement spectral response function for characterizing the optical property, said further means comprising an optical window member disposed in optical coupling relation to said sheet receiving means during the sensing of the reflectance and transmittance parameters of sheet material at said sheet receiving means and comprising translucent diffusing material exhibiting an absolute reflectance of substantial magnitude and an absolute transmittance of substantial magnitude.

4,159,875
SPECIMEN HOLDER

Stephen G. Hauser, Tarzana, Calif., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 21, 1976, Ser. No. 734,582
Int. Cl.² G02B *21/34*
U.S. Cl. 356—244 **9 Claims**

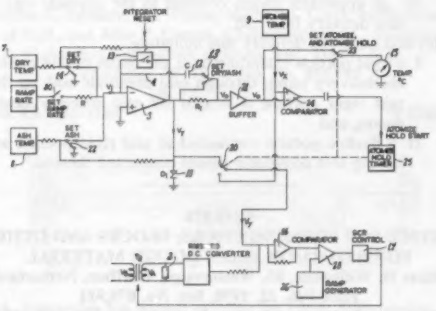


9. A specimen holder which comprises:
(a) an integral planar specimen slide;
(b) a frame encompassing said slide;
(c) nesting means defined by opposing sides of said frame to cooperate with corresponding nesting means of vertically stacked adjacent specimen holders to permit movement of one slide holder in one direction while preventing movement in a direction substantially transverse thereto; and,
(d) transport means operatively associated with said frame to permit mechanical transfer of said specimen holder.

4,159,876
FLAMELESS ATOMIZATION

Edward G. Egan, Mulgrave, and Ian S. Jackson, Glen Waverley, both of Australia, assignors to Varian Techtron Proprietary Limited, Victoria, Australia

Filed Dec. 16, 1976, Ser. No. 751,767
Claims priority, application Australia, Dec. 18, 1975, PC4332
Int. Cl.² G01J *3/30*
U.S. Cl. 356—312 **10 Claims**



8. In a spectrophotometer, an atomizer for receiving a sample to be analyzed and connectable to an electrical power source to be heated by resistance heating;
control means operable to vary the power input to said atomizer so as to change the temperature of said atomizer, and including means for selecting temperatures suitable for dry-ash, and atomized modes of operation; and
a feedback circuit connected between said atomizer and said control means and including means operable to generate an electrical analogue which at least approximates the heating response characteristics of said atomizer;

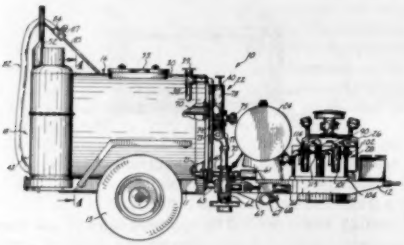
said circuit being operative to modify said power input by application of said analogue such as to substantially compensate for said heating response characteristics.

4,159,877

MATERIALS HANDLING AND APPLICATION MECHANISM

Carl C. Jacobson, Tempe; Mark C. Manning, Gilbert, and Francis K. Hill, Wickenburg, all of Ariz., assignors to Crafco, Inc., Phoenix, Ariz.

Filed Apr. 10, 1978, Ser. No. 894,892
Int. Cl.[2] B28C *1/22*
U.S. Cl. 366—22 **18 Claims**



1. A mechanism for preparing, handling and application of liquid materials comprising:

(a) a materials tank having a fill port for receiving materials and having an outlet;

(b) primary heater means in communication with said materials tank for melting and maintaining the molten state of the materials receivable in said materials tank;

(c) mixing means in said materials tank for mixing the materials receivable in said materials tank;

(d) a materials delivery plumbing system including,

I. a materials delivery pump having an inlet and an outlet,

II. a materials supply pipeline having one end connected to the outlet of said materials tank and the other end connected to the inlet of said materials delivery pump,

III. a materials delivery line having one end coupled to the outlet of said materials delivery pump, and

IV. an applicator means coupled to the opposite end of said delivery line; and

(e) said materials delivery line including,

I. a rigid portion extending from the outlet of said materials delivery pump through said materials tank so that said rigid portion is heated by said primary heater means, and

II. a flexible portion connected to said rigid portion and having said applicator means connected thereto.

4,159,878

DEVICE FOR FORMING STICKS, BLOCKS AND OTHER FORMED PARTS FROM DOUGH MATERIAL

Willem H. Willemsen, 83, Westervalge, Warffum, Netherlands

Filed Feb. 22, 1978, Ser. No. 879,911
Claims priority, application Netherlands, Feb. 22, 1977, 7701870; Aug. 9, 1977, 7708771
Int. Cl.[2] A21C *1/00*
U.S. Cl. 366—69 **4 Claims**

1. In an apparatus for producing shaped-dough pieces,

a frame,

a movable platform mounted for movement upwards and downwards on said frame,

a cylinder connected to said frame and having a lower portion forming an extrusion chamber and an upper portion forming a mixing chamber,

an extrusion piston reciprocably mounted in said cylinder and having a piston rod,

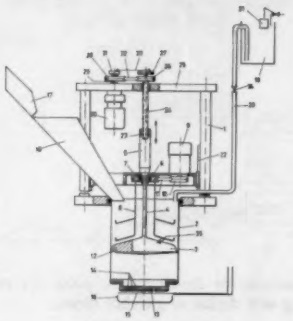
supply means to supply powdery material and liquid to said mixing chamber,

stirring means surrounding said piston rod in said mixing chamber and rotatably mounted relative to said frame,

said piston being at least movable into said mixing chamber to a position where said mixing chamber communicates with said extrusion chamber,

a press plate over the end of said cylinder opposite from said piston and having extrusion holes therethrough,

means to form spacing of the periphery of said piston from



the walls of said cylinder during the movement of the piston away from said press plate,

said powdery material and said liquid flowing from said mixing chamber to said extrusion chamber due to a suction action and having a resident time in said chambers to form a dough,

means to form a suction action upon movement of said piston away from said press plate including

residue dough over the extrusion holes in said press plate, and

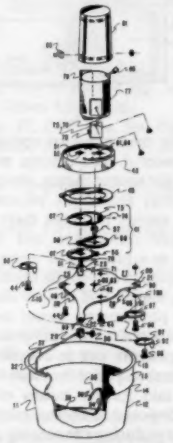
at least one cutting means mounted under said press plate.

4,159,879

BREAD MAKING MACHINE

Robert G. Coucher, Salt Lake City, Utah, assignor to Pioneer Associates #2, Salt Lake City, Utah

Filed Mar. 18, 1976, Ser. No. 668,227
Int. Cl.[2] B01F *7/16*
U.S. Cl. 366—98 **9 Claims**



1. A machine adapted to rotate a dough hook within an

open-topped mixing vessel during a mixing mode of operation at a speed of at least about 75 rpm to mix ingredients into bread dough and during a subsequent kneading mode of operation at a speed of no more than about 50 rpm to knead said dough, comprising:

driven axle means removably fixed in approximately axial alignment with said vessel and adapted to couple with said dough hook; and

a universal type, AC-DC, series wound induction motor rated between about 1/10 and about 1/15 horsepower with an unloaded speed of at least about 8,000 rpm and a speed at full load of no more than about 5,000 rpm connected to said driven axle through a speed-reducing transmission effecting a reduction of at least about 80:1; wherein

said motor is removably fixed with respect to said vessel so that said vessel is prevented from moving with respect to said motor during the kneading mode of operation; and

said kneading mode of operation is effected by an increasing load transmitted to the motor through the transmission from the dough hook.

4,159,880

CIRCULATION MIXER

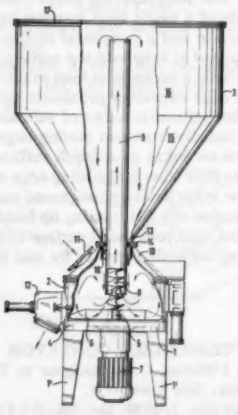
Friedrich W. Herfeld, Wall 1, 5982 Neuenrade, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,116

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1977, 2717887

Int. Cl.² B01F *5/12, 15/02*

U.S. Cl. 366—266 **8 Claims**



1. A circulation mixer comprising:

means defining a mixing chamber;

a central vertical rotary shaft in said chamber and having a centrifugal mixing device thereon;

a supply chamber above said mixing chamber and having an outlet opening communicating with said mixing chamber;

a conveying pipe extending from said mixing chamber into said supply chamber through said outlet opening substantially coaxial to said shaft, there being an annular space between said conveying pipe and said outlet opening; and

means for circulating mixed materials from said mixing chamber, through said conveying pipe, to said supply chamber.

4,159,881

TURBULENT FLOW CONVEYING DEVICE FOR A MIXTURE

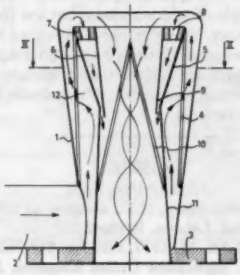
Achille Gogneau, 17, Avenue Jules Ferry, Montlucon, France (03100)

Filed Aug. 28, 1977, Ser. No. 827,683

Claims priority, application France, Sep. 2, 1976, 76 26823

Int. Cl.² B01F *5/00*

U.S. Cl. 366—337 **9 Claims**



1. A stirring and conveying device for a fuel-air mixture comprising:

a housing,

means for supplying the mixture to be treated to said housing,

a first blade means for receiving a part of the material to be treated, said first blade means including a plurality of first blades arranged in a generally conical configuration with the surfaces of the respective first blades being inclined to divide the mixture into layers and to impart a swirling motion to said layer,

and means for receiving another part of the mixture at an inlet thereof and to impart thereto an increased velocity at an outlet of said receiving means, at least one of said first blade means and said receiving means being formed to mix the materials exiting the outlets by a venturi action.

4,159,882

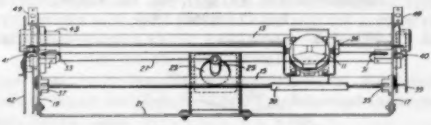
HIGH QUALITY PRINTER

Royden C. Sanders, Jr., Wilton; Michael I. Lerer, Bedford, both of N.H., and John P. Conant, Chelmsford, Mass., assignors to R. C. Sanders Technology Systems, Inc., Derry, N.H.

Filed Jun. 30, 1977, Ser. No. 811,991

Int. Cl.² B41J *3/12*

U.S. Cl. 400—124 **9 Claims**



1. Apparatus for impact printing on paper high quality alphanumeric characters from coded data using a printing means capable of producing dots of predetermined nominal diameter approximating ten mils;

means for generating a bit map timing signal having a period which is preselectable;

means responsive to said bit map timing signal for traversing said printing means across the width of a printing media in reversing passes at a speed such that the increment of head travel corresponding to the period of the bit map timing signal is essentially an order of magnitude smaller than the nominal dot diameter and about one mil;

means for advancing the paper between successive passes in increments which are substantially larger than said incre-

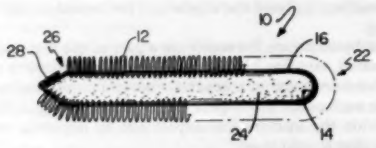
ment but are substantially smaller than the nominal dot diameter so that vertically overlapping dots may be printed on successive reversing passes;

means controlled by said bit map timing signal and operable during a traverse of said head for energizing said printing means in accordance with a stored bit map representing portions of characters to be printed on the current traverse, the lateral resolution of the bit map corresponding to the period of the bit map timing signal, the minimum distance between repeated operations of said print means being a multiple of said increment but less than said nominal dot diameter, whereby characters may be printed on successive traverses of the print head during which interlaced dot strings are printed with a horizontal resolution which is essentially an order of magnitude finer than the nominal dot diameter.

4,159,883
CLEANING PAD

Louis R. Mizell, Woodbury, N.Y., assignor to I.W.S. Nominee Company Limited, London, England

Filed Jul. 18, 1977, Ser. No. 816,752
Claims priority, application United Kingdom, Jul. 22, 1976, 30665/76
Int. Cl.[2] A47K 5/12
U.S. Cl. 401—201 **8 Claims**

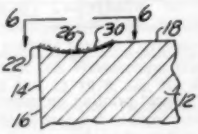


1. A cleaning pad with an internal well for cleaning agent, said pad characterized in that at least one external surface thereof is formed from a fabric and a cleaning agent impervious plastic film, yarn tufts penetrating said fabric and said plastic film, and the inner ends of the yarns forming the tufts of the tufted fabric communicating with cleaning agent in the internal well, solely through yarn-containing openings in said plastic film.

4,159,884
CUTTING TOOL

Lawrence A. Schott, 15940 Warwick, Detroit, Mich. 48223

Continuation-in-part of Ser. No. 812,450, Jul. 5, 1977. This application Aug. 19, 1977, Ser. No. 825,967
Int. Cl.[2] B26D 1/00
U.S. Cl. 407—113 **17 Claims**

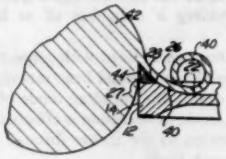


1. In a cutting tool comprising a plate of a single hard material having a bottom surface, a top surface and a peripheral surface whereby said peripheral surface and at least said top surface forms a cutting edge at their junction defining at least one cutting tip, the improvement of a perimetric shallow groove in at least said top surface, said perimetric shallow groove having an edge disposed at said cutting edge and extending radially from said cutting edge at least at said cutting tip for promoting the formation of a false cutting tip build-up during use of said cutting tool, said perimetric shallow groove having a rough surface providing an anchoring surface for said false cutting tip build-up.

4,159,885
CUTTING TOOL

Lawrence A. Schott, 15940 Warwick, Detroit, Mich. 48223

Filed Jul. 5, 1977, Ser. No. 812,450
Int. Cl.[2] B26D 1/00
U.S. Cl. 407—114 **28 Claims**



1. A cutting tool for removing chips from a workpiece comprising a plate of a single hard material having a bottom surface, a top surface and a peripheral surface whereby said peripheral surface and at least said top surface form a cutting edge at their junction, a recess in at least said top surface, said recess having an edge extending proximate said cutting edge and forming a perimetric ledge of substantially constant width extending radially from said cutting edge to said recess edge, and said recess being of a depth sufficient to cause a continuous chip to flow from said cutting edge into said recess and said perimetric ledge being in the form of a shallow groove such as to promote the formation of a false cutting tip build-up during use of said cutting tool, said perimetric ledge providing an anchoring surface for said false cutting tip build-up.

12. A cutting tool for removing chips from a workpiece comprising a plate of a single hard material having a bottom surface, a top surface and a peripheral surface whereby said peripheral surface and at least said top surface form a cutting edge at their junction, a recess in at least said top surface, said recess having an edge extending proximate said cutting edge and forming a flat perimetric ledge of substantially constant width extending radially from said cutting edge to said recess edge, and said recess being of a depth sufficient to cause a continuous chip to flow from said cutting edge into said recess, said flat perimetric ledge having a roughened surface such as to promote the formation of a false cutting tip build-up during use of said cutting tool, said roughened surface of said perimetric ledge providing an anchoring surface for said false cutting tip build-up.

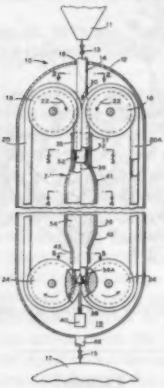
4,159,886
PRESSURIZED CONVEYOR

Warnie L. Sage, Littleton, Colo., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Feb. 2, 1978, Ser. No. 874,718
Int. Cl.[2] B65G 65/42
U.S. Cl. 414—292 **8 Claims**

1. An apparatus for conveying pulverized material to a higher pressure zone, and comprising an upright pressure vessel having an inlet and an outlet, a pair of endless flexible belts disposed within the vessel, upper and lower rotatable means for urging continuous travel of the belts, the upper rotatable means causing opposed sections of the belts to unite and form a downward traveling belt tube, a pulverized material feed pipe extending through the vessel inlet and into the belt tube and cooperating therewith to form a first pressure seal therebetween, a guide tube disposed between the upper and lower rotatable means and circumscribing both the belt tube and feed pipe, the guide tube acting on the belt tube to

compact the pulverized material therein to form a second pressure seal, and the lower rotatable means causing the belts



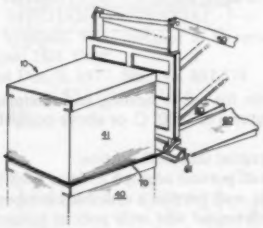
to separate and discharge the pulverized material from said belt tube.

4,159,887

LOAD CAP

Lloyd C. Dick, Cincinnati, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 3, 1977, Ser. No. 838,823
Int. Cl.[2] B65G *61/00*
U.S. Cl. 414—786 **1 Claim**



1. A method for undecking stacked, unitized sheeted material, a portion of the bottom stacked deck of said stacked sheeted material having a load cap inserted therein comprising:

(a) positioning the platen of conventional forklift apparatus in abutting relationship with the front flap of said load cap;

(b) gripping the lifting skid pallet on which the upper stacked deck of sheeted material is resting with gripping means attached to said forklift apparatus; and

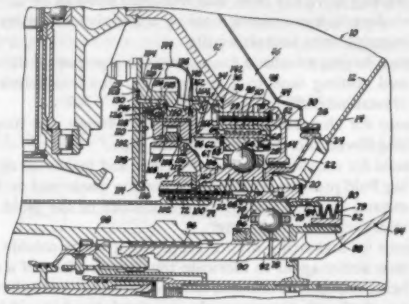
(c) pulling said lifting skid pallet on which the upper stacked deck of sheeted material is resting onto the platen of said forklift apparatus without removing said platen from their original abutting relationship with the front flap of said load cap, said load cap preventing movement of said sheeted material contained in said lower stacked portion.

4,159,888

THRUST BALANCING

Douglas K. Thompson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 7, 1977, Ser. No. 840,267
Int. Cl.[2] F01D *3/00, 3/04*
U.S. Cl. 415—105 **4 Claims**



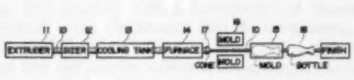
1. A rotor thrust compensator assembly for association with a gas turbine engine comprising: a rotor extension having a fore and aft segment and being axially movable in response to variable gas loads on a rotor element of a gas turbine engine, a thrust bearing having inner and outer races with anti-friction means therebetween, one of said races fixed to said rotor extension for axial movement therewith, bearing support means for the other of said races, variable axial load integrating means including a pair of relatively rotating pistons with a cavity therebetween, a pressurizable fluid system, flow regulator means including a movable carriage engageable with the other of said races and including means thereon for directing fluid into said fluid system and for directing a quantity of fluid into said cavity in accordance with rotor thrust loads acting on the one of said races, the movement of said movable carriage controlling a throttling gap for said fluid, a preload spring biased between said carriage and said bearing support and operative to compensate axial bearing loads when a first predetermined rotor thrust load is imposed on said bearing, one of said relatively rotating pistons being connected to said rotor extension, said one of said relatively rotating pistons rotating fluid within said cavity so as to produce a dynamic, rotor speed responsive centrifugal fluid head on said rotor extension to compensate second predetermined rotor thrust loadings on said bearing.

4,159,889

METHOD OF AND APPARATUS FOR TREATING THE OUTER SURFACE AND INNER SURFACE OF A PIPE OF A THERMOPLASTIC RESINOUS MATERIAL PRODUCED BY EXTRUSION

Kazuo Yagi, Iwakuni, and Kazuhiro Masumoto, Yamaguchi, both of Japan, assignors to Mitsui Petrochemical Industries, Inc., Tokyo, Japan

Division of Ser. No. 507,276, Sep. 19, 1974, abandoned. This application Feb. 24, 1977, Ser. No. 771,423
Claims priority, application Japan, Sep. 26, 1973, 48-107543; Sep. 26, 1973, 48-111459
Int. Cl.[2] B29C *17/07*
U.S. Cl. 425—71 **4 Claims**



2. In an apparatus for manufacturing a pipe of a crystalline mono-α-olefin polymer having a smooth outer surface, which

is suitable for manufacturing a biaxially orientated container by blow molding, comprising:

extruding means having an extruder for extruding a crystalline polyolefin continuous pipe;

means having a sizing die through which the pipe extruded by said extruding means is passed, said sizing die having a front end portion and a pipe-receiving sizing cavity extending inwardly from said front end portion;

a cooling tank containing cooling water therein for receiving pipe from said sizing die;

means having a furnace for heating the pipe passed through said cooling tank to a temperature which is below the crystalline melting point of the pipe,

means for elongating the pipe passed through said furnace lengthwise thereby stretching the pipe,

a mold for receiving the stretched pipe and means for applying fluid pressure within a pipe portion inside said mold to expand the pipe portion to the contour of the mold, the improvement comprising:

means on said sizing die for supplying a water soluble surface active agent to lubricate the outer surface of a pipe being introduced into said sizing cavity, said means having a surface active agent supply opening formed at said front end portion of said sizing die above said sizing cavity,

a surface active agent supply line in communication with said supply opening,

a recess formed in said front end portion of said sizing die in the vicinity of said supply opening,

a groove formed in said front end portion of said sizing die and extending downwardly from said recess to said sizing cavity,

and at least one ring-shaped groove formed in said sizing cavity and disposed slightly inwardly of said front end portion to provide a continuous film of surface active agent which adheres to said pipe.

4,159,890

PAVING MATERIAL EXTRUSION MOLDING APPARATUS

Koji Ogaki, Yokohama; Katsu Hirosawa; Masashi Kaminishi, both of Hiratsuka; Yoshinori Nozawa, Tokyo; Hiroshi Kakuta, Isehara, and Akio Aoki, Chigasaki, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

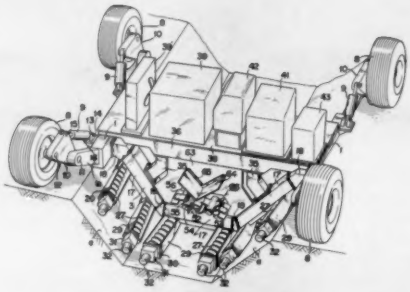
Filed Dec. 7, 1977, Ser. No. 858,380

Claims priority, application Japan, Dec. 9, 1976, 51/147160; Dec. 9, 1976, 51/147161; Dec. 9, 1976, 51/148586

Int. Cl.[2] B28B *13/02*

U.S. Cl. 425—59 **13 Claims**

1. A paving material extrusion molding apparatus adapted for laying a paving material of a predetermined thickness on the surface of a trench which has previously been excavated under the ground, comprising: (a) a body formed by a pair of parallel frames and a stand extending on and carried by the frames; (b) power generating means mounted on said body; (c) molding means having a predetermined shape, said predetermined shape being similar to that of said excavated trench and being mounted at a predetermined spaced interval therefrom on the lower part of said body; (d) a plurality of paving material conveyor means mounted in the front of said molding means; and (e) a paving material lifting means mounted in the front and lower part of the molding means and in the approximately central part of the extrusion molding apparatus so that paving material piled on a central horizontal part of the excavated trench can be raised up on inclined parts formed on both



sides of the trench thereby enabling the paving material to be scattered uniformly.

4,159,891

CRUCIBLE

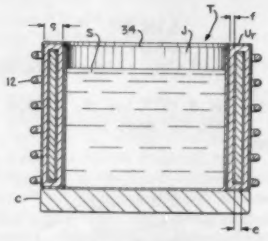
Walter Schmidt, Schaffhausen, Switzerland; Franz Sperner, Hanau, Fed. Rep. of Germany, and Walter Stählin, Schaffhausen, Switzerland, assignors to Prolizenz AG, Chur, Switzerland

Continuation of Ser. No. 664,700, Mar. 8, 1976, abandoned. This application Aug. 10, 1977, Ser. No. 825,990

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1975, 2510684

Int. Cl.[2] F27B *14/00, 14/10*

U.S. Cl. 432—264 **16 Claims**



1. A crucible for use in heating and retaining melts at elevated temperatures of 1800° C. or above comprising, in combination:

a circumferential side wall portion;

a bottom wall portion adapted to form with said circumferential side wall portion a crucible chamber;

said circumferential side wall portion comprises a support body composed of a refractory metal alloy;

a continuous coating layer composed of a metal or combination of metals chosen from the group consisting of the platinum metals and completely enveloping said support body; and a high-temperature resistant oxide intermediate layer disposed between said support body and said coating layer wherein said intermediate layer prevents diffusion between the coating layer and the support body.

4,159,892

METHOD OF PRINT DYEING TEXTILE MATERIALS FROM A PHOTOGRAPH AND PRODUCTS MADE THEREFROM

Jon M. Blumenaus, Dalton, Ga., assignor to World Carpets, Inc., Dalton, Ga.

Filed Aug. 30, 1977, Ser. No. 829,250
Int. Cl.[2] G03C 5/00; G03F 5/00
U.S. Cl. 8—62 4 Claims

1. A method for continuously print dyeing textile fabrics with a continuous pattern wherein the image to be reproduced is taken from a photograph and provides a continuous pattern having a three dimensional appearance on the face of the fabric which comprises setting off a selected area of the photograph to form a pattern within a predetermined outline to establish the basic repeat for the pattern, preparing a plurality of continuous tone color separations of the selected pattern to provide red, green, blue and black continuous tone negatives which represent the colors of the original image, preparing a posterized and half-tone positive of each color separation, combining the posterized and half-tone positives to provide a negative, engraving one or more screens with the combined negative, passing the fabric to be dyed under the engraved screens and selectively applying dye stuff through the screens to reproduce the pattern on the face of the fabric.

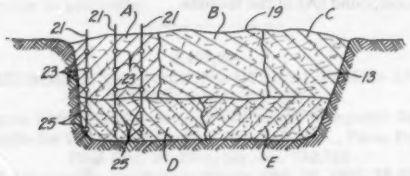
3. A method for continuously print dyeing flat dyeable textile material with a continuous pattern wherein the image to be reproduced is taken from a photograph and provides a continuous pattern having a three dimensional appearance on the face of the material which comprises setting off a selected area of the photograph to form a pattern within a predetermined outline to establish the basic repeat for the pattern, preparing a plurality of continuous tone color separations of the selected pattern to provide red, green, blue and black continuous tone negatives which represent the colors of the original image, preparing a posterized and a half-tone positive of each color separation, combining the posterized and half-tone positive to provide a positive, engraving one or more screens with the combined positives, passing the material to be dyed under the engraved screens and selectively applying dye stuff through the screens to reproduce the pattern on the face of the material.

4,159,893

METHOD OF TESTING A LANDFILL FOR ITS METHANE POTENTIAL

Robert K. Ham, Madison, Wis., assignor to Reserve Synthetic Fuels, Inc., Signal Hill, Calif.

Filed Dec. 5, 1977, Ser. No. 857,574
Int. Cl.[2] G01N 33/24
U.S. Cl. 23—230 EP 11 Claims



1. A method of testing a landfill for its methane potential comprising:

selecting a landfill which contains a selected fraction with said selected fraction consisting essentially of cellulose;

locating a plurality of zones within the landfill with each of said zones acting substantially uniformly with respect to decomposition of the selected fraction;

taking at least one sample of the material of the landfill at each of said zones;

measuring the selected fraction content of each of said samples; and

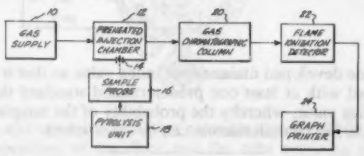
utilizing the measured selected fraction content of at least some of said samples to find the approximate methane potential of the landfill.

4,159,894

METHOD FOR DETERMINING FORMULATION AND CHEMICAL STRUCTURE OF MATERIALS BY IMPROVED PYROLYSIS GAS CHROMATOGRAPHY

John C. Hu, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 13, 1978, Ser. No. 877,336
Int. Cl.[2] G01N 1/10, 1/22
U.S. Cl. 23—230 PC 20 Claims



1. A method for separating and analyzing a sample containing at least one volatile component and at least one nonvolatile, pyrolyzable component comprising:

establishing a flow of gaseous carrier fluid a sample injection chamber and thereafter through a chromatographic column,

preheating the carrier gas flowing said injection chamber to a first predetermined temperature sufficiently high to vaporize said volatile component and below the pyrolysis temperature of said nonvolatile, pyrolyzable component,

inserting said sample into said injection chamber while maintaining the temperature of said carrier gas passing through said chamber at said first predetermined temperature, allowing said volatile component to vaporize and pass through said chromatographic column with said carrier gas,

after said volatile component has been vaporized from said sample and eluted from said column, heating said sample to a second predetermined temperature at which said nonvolatile component will be pyrolyzed to a gaseous reaction product, and

allowing said reaction product to pass through said chromatographic column with said carrier gas.

4,159,895

METHOD AND APPARATUS FOR THE DETECTION OF BETA THALASSAEMIA MINOR

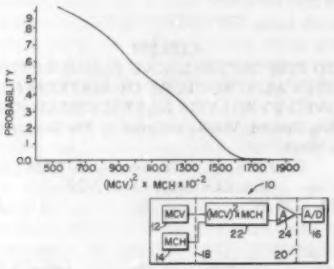
Ian B. Shine, Lexington, Ky., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Mar. 24, 1978, Ser. No. 889,869
Claims priority, application United Kingdom, Mar. 30, 1977, 12779/77
Int. Cl.[2] G01N 33/16
U.S. Cl. 23—230 B 12 Claims

1. A method for detecting carriers of thalassaemias, especially beta thalassaemia minor, comprising the steps of: obtaining from a blood sample the measurements of mean corpuscular volume of the red blood cells and the mean corpuscular haemoglobin; developing as a thalassaemia index value the mathematic product of said two parameter measurements; and comparing said product with a predetermined thalassaemia index threshold value, the amount that the thalassaemia index value is less than the threshold value being proportional to the probability that the sample is from a thalassaemia carrier.

10. Apparatus for use in detecting carriers of thalassaemias, especially beta thalassaemia minor, said apparatus comprising: means for obtaining from a blood sample the measurements of the parameters of the mean corpuscular volume of the red

blood cells and the mean corpuscular haemoglobin; means for developing as a thalassaemia index value the mathematic product of the two parameter measurements; and means for presenting the developed thalassaemia index value so that it can be compared with at least one predetermined standard thalassaemia index value, whereby the probability of the sample being from a carrier of thalassaemia can be ascertained.

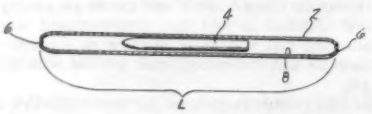


4,159,896

ENHANCEMENT OF SEPARATION OF CELL LAYERS IN CENTRIFUGED BLOOD SAMPLE

Robert A. Levine, Guilford, and Stephen C. Wardlaw, Branford, both of Conn., assignors to James V. Massey, III, Trumball, Conn., a part interest

Continuation-in-part of Ser. No. 758,065, Jan. 10, 1977, abandoned. This application May 30, 1978, Ser. No. 910,807
Int. Cl.² A61B *5/14*; G01N *33/16*
U.S. Cl. 23—230 B **7 Claims**



1. A method for clarifying the interface between an enhanced white cell layer and the red cell layer in a centrifuged sample of blood including the step of adding to the blood sample an additive in an amount effective to prevent any immature red cells from being suspended in the adjacent white cell layer by increasing the specific gravity of the red cells without significantly altering the specific gravity of a significant number of the white cells.

4,159,897

PRODUCING FLUID FUEL FROM COAL

David H. Doehlert, Earleville, Md., assignor to Fluid Coal Corporation, Wilmington, Del.

Filed Oct. 13, 1977, Ser. No. 841,831
Int. Cl.² C10L *9/10, 1/32*; C10G *1/00*
U.S. Cl. 44—51 **6 Claims**

1. A process for producing a fluid fuel from a quantity of coal comprising the steps of:

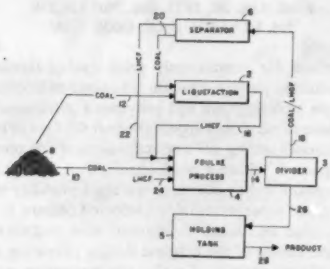
treating a portion of said quantity of coal to produce a liquid hydrocarbon fuel; and

combining the remainder of said quantity of coal with said liquid hydrocarbon fuel to produce a product;

the process also including the step of reducing said remainder to a sufficiently small particle size to permit said product to flow as a suspension;

in which said remainder of said quantity of coal is combined with said liquid hydrocarbon fuel by introducing both said liquid hydrocarbon fuel and said remainder into a concentrator, cleaning said remainder in the concentrator using said liquid hydrocarbon fuel as a cleaning medium, by effecting settling of undesired particles, and removing from the concentrator a suspension of coal particles in said liquid hydrocarbon fuel as the product; and

in which at least a portion of said product is treated to separate coal therefrom, and at least part of the coal thus separated from said product is combined with said portion of said quantity of coal and treated along with said portion of said quantity of coal to form said liquid hydrocarbon fuel.



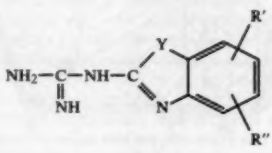
4,159,898

ALKYL-GUANIDINO-HETEROCYCLIC COMPOUNDS, THEIR MANUFACTURE AND USE AS ADDITIVES FOR FUELS AND LUBRICANTS

Choua Cohen, and Bernard Sillion, both of Grenoble, France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Division of Ser. No. 608,966, Aug. 29, 1975, Pat. No. 4,071,459. This application Nov. 7, 1977, Ser. No. 849,277
Claims priority, application France, Sep. 10, 1974, 74 30819
Int. Cl.² C10L *1/24*
U.S. Cl. 44—63 **10 Claims**

1. A fuel composition comprising a major amount of gasoline, and in sufficient proportion to obtain dispersing properties at least one alkyl-guanidino benzimidazole compound produced by alkylation at 100°–250° C. with a halogenated hydrocarbon of the general formula RX_n, of a guanidino-heterocyclic compound (A) of the formula



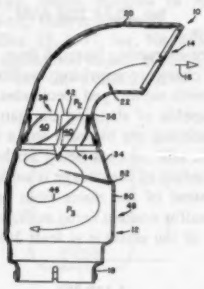
in which R is a hydrocarbon radical containing about 10 to 200 carbon atoms, X is a halogen atom and n is 1 or 2; Y is —NH—, R' and R'' are each a hydrogen atom, or an alkyl radical having from 1 to 10 carbon atoms, or a —Z—Ar group in which Z is —O—, —S—, or alkylene and Ar is aromatic hydrocarbyl or R' and R'' together, when they are in ortho position, represent a carbocyclic ring fused to the benzene ring, the proportion of the reactants being 0.7–2.5 moles of (A) per gm. atom of halogen in RX_n.

4,159,899

PRECLEANER ASSEMBLY

Charles L. Deschenes, N. Attleboro, Mass., assignor to Fram Corporation, East Providence, R.I.

Filed Aug. 26, 1977, Ser. No. 827,924
Int. Cl.[2] B01D *45/12*
U.S. Cl. 55—454 9 Claims



1. In a vehicle, a precleaner assembly for the engine air intake system for separating particulate material from the entering air comprising a housing having an inlet and a outlet facing a direction other than the direction faced by said inlet, said housing defining a flow path between said inlet and said outlet and having a converging conduit section having a bend communicated with the inlet and turning the air communicating through the inlet into the direction faced by the outlet, and a diverging conduit section communicated with an outlet conduit section, wherein the entrance to said diverging conduit section presents a smaller cross-sectional area than the cross-sectional area at the exit of said diverging conduit section so that air communicated through the diverging conduit section is expanded, the exit from the converging conduit section presenting a smaller cross-sectional area than the entrance to the converging conduit section so that air communicated through the converging conduit section is compressed, the exit from the converging conduit section and the entrance to the diverging conduit section joining to define a throat whereby fluid entering said inlet is compressed by said converging conduit section to a maximum pressure level at said throat, means in said diverging conduit section for turning the fluid into a spiral path so that centrifugal forces generated by movement of the particulate material in said spiral path urge said particulate material toward the wall of said housing, said turning means having an inlet, the inlet of said turning means being located substantially at said throat, and means for ejecting from said outlet conduit section the portion of the fluid adjacent the wall of said outlet conduit section in which said particulate material is concentrated, the rest of said air being communicated in an axial direction to said outlet.

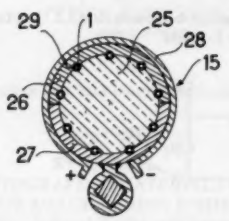
4,159,900

METHOD OF CONNECTING OPTICAL FIBERS AND CONNECTION BENCH

Jacques Eldin, Viroflay, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A., Paris, France

Filed Oct. 15, 1976, Ser. No. 732,742
Claims priority, application France, Oct. 22, 1975, 75 32298
Int. Cl.[2] C03B *37/00*
U.S. Cl. 65—4 B 5 Claims

1. An optical fiber connection bench for connecting two bundles each of n optical fibers in n capillary tubes each of which has a bore whose diameter, at least over a central portion of the bore length, is very slightly greater than each diameter of the two fibers to be accommodated therein for connection, wherein the fibers are guided into the tube until their faces are in contact with each other in the central portion of the tube and transverse vibrations of small amplitude are applied to the fibers while they are being guided into the tube, comprising a beam mounted on a support, a vibrator in mechanical contact with the beam for applying transverse vibrations to the beam, two fiber support parts supported by said beam, one of said parts for each bundle of optical fibers, each fiber support part being slideably mounted on the beam and including a plurality of fiber retaining passages alined with the beam, a capillary tube support part also supported by said beam and being disposed in between the fiber support parts and including a plural-



ity of çapillary tubes retaining passages alined with the beam, the disposition of the fiber and the tube retaining passages being identical so that, in operation, fibers from the two bundles may be clamped in respective ones of the fiber retaining passages with an appropriate length of bared fiber end projecting towards the tube support part, the tube support part fitted with capillary tubes, and the fiber support parts moved towards each other and the tube support part with the vibrator in operation until the ends of the corresponding fibers are properly spaced in their respective tubes.

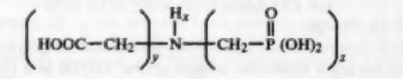
4,159,901

CORROSION INHIBITED AGRICULTURAL COMPOSITIONS

George B. Beestman, St. Louis, and Erhard J. Prill, Kirkwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 797,083, May 16, 1977, abandoned. This application Dec. 27, 1977, Ser. No. 862,691
Int. Cl.[2] A01N *9/36*
U.S. Cl. 71—86 24 Claims

1. A herbicidal or plant growth regulant composition comprising an active ingredient selected from the aminomethylenephosphonic acids of the formula



wherein y and z are each individually 1 or 2, and x is 0 or 1, the sum of x, y and z being 3, and the agriculturally acceptable salts and esters thereof, at least one of water or a surfactant, and a metal corrosion inhibiting amount of a thio compound selected from alkane thiols having from 2 to 16 carbon atoms in the alkane moiety, aromatic thiols, the alkali metal salts of said thiols and the ammonium and alkali metal thio salts of polybasic inorganic acids.

21. A method which comprises contacting a plant with a phytotoxic amount of an agueous herbicidal composition comprising an amine salt of N-phosphonomethylglycine, a surfactant and a metal corrosion inhibiting amount of a thio compound selected from alkane thiols having from 2 to 16 carbon atoms in the alkane moiety, aromatic thiols, the alkali metal salts of said thiols and the ammonium and alkali metal thio salts of polybasic inorganic acids.

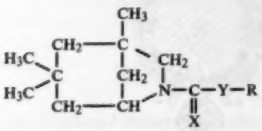
4,159,902

1,3,3-TRIMETHYL-6-AZABICYCLO-(3.2.1)-OCTANE-6-CARBOXYLIC ACID ESTER, HERBICIDES, PROCESS FOR MAKING SAME AND COMPOSITION CONTAINING SAME

Friedrich Arndt, and Ludwig Nüsslein, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jul. 26, 1977, Ser. No. 819,415
Int. Cl.[2] C07D *209/02;* **A01N** *9/22*
U.S. Cl. 71—95 **18 Claims**

1. 1,3,3-trimethyl-6-azabicyclo-(3.2.1)-octane-6-carboxylic acid ester of the formula



in which R is alkyl of 1 to 7 carbon atoms, chloro-alkyl of 1 to 7 carbon atoms, alkenyl of 2 to 7 carbon atoms, chloroalkenyl of 2 to 7 carbon atoms, alkinyl of 2 to 7 carbon atoms, benzyl, chlorobenzyl, phenyl, naphthyl, chlorophenyl, alkylphenyl having 1 to 4 carbon atoms in the alkyl moiety of chloroalkylphenyl having again 1 to 4 carbon atoms in the alkyl portion and wherein X and Y are oxygen or sulphur.

17. A herbicidal composition comprising at least one active agent as defined in claim 1 in an amount from about 10 to 80% by weight and a liquid or solid carrier material in an amount of about 90 to 20% by weight.

4,159,903

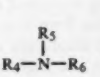
ENHANCEMENT OF POLYISOPRENE LATEX PRODUCTION

Albert J. Bauman, Sierra Madre, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Jul. 27, 1977, Ser. No. 819,263
Int. Cl.[2] A01N *9/12, 9/22, 9/24, 9/20*
U.S. Cl. 71—98 **10 Claims**

1. A method of stimulating the production of polyisoprene latex having a molecular weight above 300,000 in a Guayule plant comprising the step of:

administering to the plant an amount effective to increase production of polyisoprene by at least 20% of a bioinducing agent of the formula:



where R_5 and R_6 are selected from phenyl, $-CH_2(CH_2)_qR_7$ where q is an integer from 1 to 6, R_7 is hydrogen; phenyl; an electron withdrawing group; R_9 phenyl- where R_9 is alkyl of 1 to 6 carbon atoms or an electron withdrawing group; $-(CH_2)_p\text{-}O\text{-}R_8$ or $-(CH_2)_pS-R_8$ where p is an integer from 2 to 6, R_8 is hydrogen, alkyl of 1 to 4 carbon atoms, phenyl or phenyl R_9, and R_4 is hydrogen or R_5, and at least one of R_4, R_5 and R_6 has the structure: $-CH_2-(CH_2)_q-R_7$.

4,159,904

PROCESS FOR EXTRACTING BISMUTH FROM A BISMUTH-BEARING MATERIAL

Robert H. Maes, Hove, and Luc M. Fontainas, Antwerp, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Antwerp, Belgium

Filed Jun. 7, 1978, Ser. No. 913,576
Claims priority, application Luxembourg, Jun. 14, 1977, 77538
Int. Cl.[2] C22B *4/04*
U.S. Cl. 75—10 R **10 Claims**

1. A process for extracting bismuth from a sulfur-containing bismuth-bearing charge, comprising smelting the charge in an electric furnace with submerged electrodes with addition of at least one flux capable of slagging the gangue, and tapping a matte phase containing the bismuth and a separate slag phase from the furnace, said process being further characterized in that the sulfur content of the charge is sufficiently high so that the bismuth content of the matte does not exceed 20% by weight and said sulfur content being sufficiently low so that the bismuth content of the matte is at least 3% by weight.

4,159,905

METHOD OF MANUFACTURING GREEN HOT BRIQUETTES FROM FINE COAL FOR USE IN SHAFT FURNACES

Werner Peters, Wattenscheid; Josef Langhoff, Dinslaken; Siegfried Henkel, Blankenstein, and Klaus D. Haverkamp, Gelsenkirchen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH and Rheinstahl Huttenwerke AG, both of, Fed. Rep. of Germany

Continuation of Ser. No. 96,258, Dec. 8, 1970, abandoned. This application Jan. 24, 1975, Ser. No. 543,888
Int. Cl.[2] C21B *5/00*
U.S. Cl. 75—42 **3 Claims**

1. A method of operating blast furnaces, by using green hot briquettes produced from fine coal as fuel and wherein the green briquettes are formed by carbonizing the coal at a temperature of from about 600° to 900° C., mixing the carbonized coal with approximately 20 to 40% of fine, cold, well-caking coal, and hot-briquetting the mixture at temperatures between around 300° and 500° C. and directing the briquettes into the blast furnace without further processing thereof.

3. A method of operating a shaft furnace by using briquettes as fuel made by carbonizing fine coal of a grain size less than 3 mm at a temperature of from about 600° to 900° C., then mixing it with about 20 to 40% of fine well-caking coal, and thereafter briquetting this mixture at a temperature of about 300° to 500° C. and directly using this fuel in the blast furnace without coking it.

4,159,906

METHOD AND COMPOSITION FOR THE DESULFURIZATION OF MOLTEN METALS

Walter Meichsner, Homberg; Heinrich Röck, Trostberg; Alfred Freissmuth, Trostberg; Horst Prietzel, Trostberg; Heinrich Rellermeyer, Duisburg-Hamborn; Wolfgang Ullrich, Rheinkamp-Baerl; Erich Pfluger, Trostberg, and Raymund Sindermann, Tacherting, all of Fed. Rep. of Germany, assignors to Süddeutsche Kalkstickstoff-Werke Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Division of Ser. No. 408,954, Oct. 23, 1973, Pat. No. 4,078,915. This application May 18, 1977, Ser. No. 797,973
Int. Cl.[2] C21C *7/02*
U.S. Cl. 75—58 **39 Claims**

1. Composition for the desulfurization of molten metals comprising at least one member selected from the group consisting of calcium carbide and calcium cyanamide as the desulfurizing agent present in an amount of at least 30 percent by weight and, in addition, a solid substance yielding water at desulfurization temperatures selected from the group consisting of calcium hydroxide, aluminum hydroxide, clay, perlite,

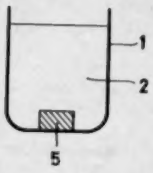
kaolin, a carbohydrate, phthalic acid, glucolic acid, an organic polymer containing hydrogen and oxygen, and a polyalcohol.

4,159,907

METHOD FOR MELTING ALUMINUM SCRAPS

Kunio Amino, Tokyo, Japan, assignor to Amino Aluminium Industries, Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1977, Ser. No. 863,051
Claims priority, application Japan, Dec. 23, 1976, 51-154223
Int. Cl.[2] C22B *21/00*
U.S. Cl. 75—68 R 4 Claims



1. A method for the melting of aluminum scraps in a single molten aluminum bath which is open to the atmosphere, which method comprises shredding said aluminum scraps into particles most of which have maximum diameters of between 2 mm and 20 mm, removing from said particles paint, synthetic resin, paper and iron debris mingling therein, then compressing the resultant aluminum particles at ambient temperatures under a magnitude of pressure greater than the yield strength of aluminum into compressed masses having an apparent specific gravity of said molten aluminum bath, and subsequently introducing and melting said compressed masses in said molten aluminum bath.

4,159,908

ALKALI METAL CONTAINING BATTERY GRID LEAD ALLOY

M. Vikram Rao, Princeton Junction; George S. Foerster, Hightstown, both of N.J., and Ranna K. Hebbar, Bombay, India, assignors to N L Industries, Inc., New York, N.Y.

Filed Aug. 14, 1978, Ser. No. 933,425
Int. Cl.[2] C22F *11/10*
U.S. Cl. 75—167 11 Claims

1. A lead alloy characterized by good ductility and being resistant to corrosion in an acid environment consisting essentially of from 0.5% to 3.0% antimony, from 0.01% to 0.7% arsenic, from 0.001% to 0.7% tin, a member selected from the group consisting of from 0.001% to 0.015% sulfur, from 0.001% to 0.05% selenium, and admixtures thereof, a member selected from the group consisting of from 0.001% to 0.05% of an alkali metal and admixtures thereof, balance essentially lead.

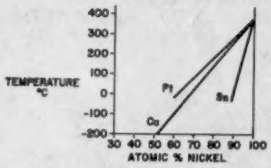
4,159,909

CATHODE TARGET MATERIAL COMPOSITIONS FOR MAGNETIC SPUTTERING

Richard W. Wilson, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 818,681, Jul. 25, 1977, Pat. No. 4,094,761.
This application Mar. 9, 1978, Ser. No. 884,948
Int. Cl.[2] C23C *15/00*
U.S. Cl. 75—170 9 Claims

1. A method for forming a cathode target for a magnetron sputtering apparatus, which comprises: forming said target of an alloy of a ferromagnetic material and a non-ferromagnetic material such that said alloy has a Curie temperature lower than the temperature attained by said cathode target during a



sputtering operation and said alloy is amenable to magnetron sputtering.

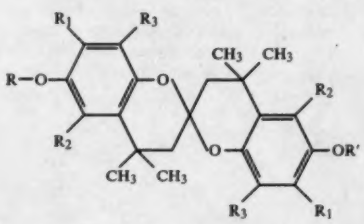
4,159,910

COLOR PHOTOGRAPHIC MATERIALS CONTAINING COLOR IMAGE FADING INHIBITOR

Mitsuto Fujiwhara; Takashi Sasaki, and Takashi Uchida, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1977, Ser. No. 822,635
Claims priority, application Japan, Aug. 9, 1976, 51-94667
Int. Cl.[2] G03C *1/76*
U.S. Cl. 96—74 13 Claims

1. A color photosensitive material comprising a support and a silver halide photosensitive layer, said material containing a compound represented by the formula:



wherein R_1 represents an alkyl, alkenyl, aryl, alkoxyl, alkenoxyl or aryloxyl group; R_2 and R_3 individually represent hydrogen, halogen, or an alkyl, alkenyl, or alkoxyl group; R represents an alkyl, alkenyl, cycloalkyl, aryl or heterocyclic group selected from imidazolyl, furyl, pyridyl, or thiazolyl or a R_6CO—, R_7SO_2— or R_8NHCO— group; R′ is hydrogen or an R_6CO—, R_7SO_2—, or R_8NHCO— group; in which R_6, R_7 and R_8 individually represent an alkyl, alkenyl, cycloalkyl, aryl or heterocyclic group selected from imidazolyl, furyl, pyridyl and thiazolyl; and, when R′ represents the R_6CO—, R_7SO_2— or R_8NHCO-group, R can be either the same as or different from R′.

4,159,911

METHOD OF MIXING STEEL FIBER REINFORCED CONCRETE

Takeshi Takazuka, Yokohama, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

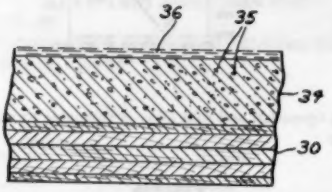
Filed Feb. 23, 1978, Ser. No. 880,498
Claims priority, application Japan, Feb. 28, 1977, 52-20109
Int. Cl.[2] C04B *7/02, 31/04*
U.S. Cl. 106—99 6 Claims

1. A method of mixing steel fibers having a surface to weight ratio of over 900 mm^2/g into a concrete mix comprising the steps of orientating said steel fibers in a predetermined direction and randomly directing said orientated steel fibers into said concrete mix through grating means having a grating space which is about 2 to 4 times the length of each of said steel fibers.

4,159,912
ACOUSTICAL FLOOR PREPARATION AND METHOD

Ronald M. Jorgenson, Minneapolis, Minn., assignor to Acoustical Floors, Inc., Hamel, Minn.

Filed Mar. 9, 1977, Ser. No. 775,738
Int. Cl.[2] C04B *11/00*
U.S. Cl. 106—109 6 Claims



1. A fluid, watery, self-leveling, sand-containing flooring preparation for pouring an acoustical floor curable with minimal expansion to form a hard, strong floor having sand substantially homgeneously distributed therethrough, the preparation comprising a well-mixed slurry containing

a. 10 parts by weight of a composition including at least about 90% by weight of calcium sulfate hemihydrate and capable, when violently mixed with sand and water in the weight ratio of ½/0.68 and poured into a ¾ in. deep layer, of hardening within 20–60 minutes at 70° F. without significant settling of the sand;

b. about 13 to about 30 parts by weight of sand; and

c. sufficient water in the range of about 5 to about 8.5 parts by weight to provide the slurry, when mixed violently, with a runny, watery fluid, self-leveling consistency.

4,159,913
SILICEOUS MATERIALS

James D. Birchall, and Roger M. Pybus, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jun. 3, 1977, Ser. No. 803,232
Claims priority, application United Kingdom, Jun. 4, 1976, 23157/76
Int. Cl.[2] C09C *1/44, 1/28*
U.S. Cl. 106—307 11 Claims

1. In a process for the manufacture of a siliceous filler which comprises contacting a particulate siliceous filler with an organic compound at elevated temperature, whereby the organic compound is catalytically decomposed to form an adherent carbonaceous coating on the surface of the said particulate siliceous filler, the improvement which comprises treating the siliceous filler particles which contain alkali metal ions in a quantity sufficient to impede catalytic decomposition to form the carbonaceous coating first with a solution of an ammonium salt or a salt of an organic base so as to displace alkali metal ions therefrom and then removing the solution so as to leave the siliceous filler particles depleted of at least a portion of their alkali metal ion content.

4,159,914
PHOTOVOLTAIC CELL

John F. Jordan, and Curtis M. Lampkin, both of El Paso, Tex., assignors to Photon Power, Inc., El Paso, Tex.

Continuation-in-part of Ser. No. 631,815, Nov. 14, 1975, Pat. No. 4,086,101, which is a continuation-in-part of Ser. No. 508,570, Sep. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 431,705, Jan. 8, 1974, Pat. No. 3,880,633. This application Mar. 31, 1978, Ser. No. 892,375
The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.
Int. Cl.[2] H01L *31/06*
U.S. Cl. 136—89 TF 17 Claims

1. A photovoltaic cell, comprising

an electrically conductive substrate,

a first layer containing CdS,

a second layer of Cu_xS superposed on said first layer and forming a photovoltaic heterojunction therewith, and

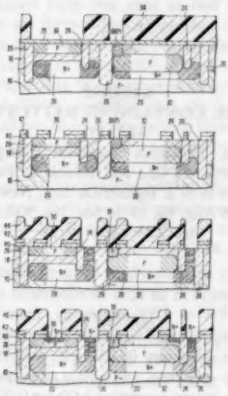
an electrode contacting said second layer,

said first layer containing a compound of a selected metal in an amount effective to provide at least a portion of said CdS in said first layer with an amorphous structure resistant to permeation by said Cu_xS through said first layer to said electrically conductive substrate.

4,159,915
METHOD FOR FABRICATION VERTICAL NPN AND PNP STRUCTURES UTILIZING ION-IMPLANTATION

Narasipur G. Anantha, Hopewell Junction; Harsaran S. Bhatia, Wappingers Falls, and James L. Walsh, Hyde Park, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,767
Int. Cl.[2] H01L *21/265, 21/74*
U.S. Cl. 148—1.5 14 Claims



1. Method for fabricating vertical NPN and PNP structures on the same semiconductor body comprising:

providing a P monocrystalline semiconductor substrate;

forming a pattern of N regions in said substrate;

growing an N epitaxial layer on the surface of said substrate having said N regions;

forming isolated regions of monocrystalline semiconductor in said substrate having said epitaxial layer thereon wherein said N regions are within the isolated regions designated to have NPN and PNP devices formed therein;

implanting a buried P emitter region in the PNP designated regions;

simultaneously forming the P base region in the NPN designated regions and a P emitter reachthrough in the PNP designated regions;

simultaneously forming an N reachthrough to the collector

region in the NPN regions and the N region under the PNP regions;

simultaneously forming the N emitter region in the NPN regions, an N contact region to the collector reach-through in the NPN regions, and N contact region to the N region under the PNP regions, and an N base contact region to the said N epitaxial layer in the PNP regions;

forming a Schottky Barrier collector contact in the PNP regions; and

forming electrical contacts to the NPN and PNP regions in said body, and to the N region under the PNP region for the junction isolation of the PNP structures from the rest of said semiconductor body.

4,159,916
THERMAL MIGRATION OF FINE LINED CROSS-HATCHED PATTERNS

Douglas E. Houston, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 13, 1978, Ser. No. 941,922
Int. Cl.[2] H01L *21/225*
U.S. Cl. 148—1.5 **5 Claims**

1. In the method of moving a melt of metal-rich semiconductor material in the configuration of at least two intersecting wire lines of no greater than 2 mils in width through a solid body of semiconductor material by thermal gradient zone melting processing comprising the steps of

selecting a matrix body of single crystal semiconductor material so that the body has a first type conductivity, a selected resistivity, and at least one major surface having a preferred planar crystal structure orientation of (100), the vertical axis of the body being substantially aligned with a first axis of the crystal structure;

preparing the surface having the preferred planar crystal structure orientation to accommodate one or more physical configurations of a layer of metal thereon;

depositing a layer of a metal on the selected surface of the body of semiconductor material;

heating the body and the metal to a temperature sufficient to form a melt of metal-rich material on the surface of the body;

establishing a temperature gradient along substantially the vertical axis of the body and the first axis of the crystal structure; p1 migrating the metal-rich melt through the body along the first axis of the crystal structure to divide the body into a plurality of regions of first type conductivity and to form at least one array of regions of recrystallized material of the body having solid solubility of the vapor deposited metal therein, the metal including at least one dopant impurity material therein to impart a second and opposite type conductivity and a selected level of resistivity thereto,

then improvement in the method of processing which includes

orienting the at least two intersecting wire lines in a preferred crystal axis direction which is parallel to <011> for one wire line and <011> for the other line, and

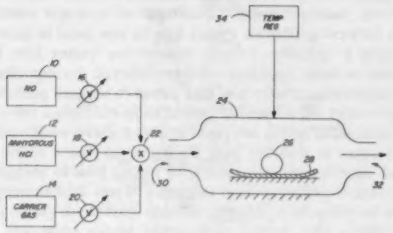
establishing the unidirectional thermal gradient at from 2° to 10° off the crystal axis of migration.

4,159,917
METHOD FOR USE IN THE MANUFACTURE OF SEMICONDUCTOR DEVICES

Ronald M. Gluck, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 27, 1977, Ser. No. 801,434
Int. Cl.[2] H01L *21/302, 7/34*
U.S. Cl. 148—1.5 **1 Claim**

1. In a method for the manufacture of a silicon semiconductor device, said method comprising at least one step in which such device is exposed to a high-temperature gaseous environment, the improvement of gettering metallic gold and other impurities from the silicon of said device comprising the step of exposing said device for a period of less than ten minutes, prior to said exposure to said gaseous environment, to an anhydrous cleaning gas mixture containing nitric oxide and hydrogen chloride together with a carrier gas of molecular nitrogen, said



cleaning gas mixture being in the temperature range of 850° C. to 1100° C., and being comprised of a gas mixture of at least four parts of molecular nitrogen to one part of the combination of nitric oxide and hydrogen chloride.

4,159,918
METHOD OF MANUFACTURING A COMPOUND STEEL MATERIAL OF A HIGH CORROSION RESISTANCE

Ludwig von Bogdandy, Oberhausen-Sterkrade, and Hans Kosmider, Bremen, both of Fed. Rep. of Germany, assignors to Klöckner-Werke AG, Duisburg, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 926,142
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732778
Int. Cl.[2] C21D *1/74*
U.S. Cl. 148—12.1 **11 Claims**

1. A method of manufacturing a compound steel material having at least one chromium steel coating layer, comprising the steps of alloying a carbon steel carrier material with a carbide and nitride forming substance; compounding the alloyed carrier material with a chromium steel material of normal carbon content; hot-rolling the compound steel material to a sheet; and increasing the corrosion resistance of the chromium steel material of the sheet to that of a superferritic material, including annealing the compound steel material at a temperature and for a time period sufficient for the carbon content of the ferritic chromium steel coating layer to be reduced to between 0.001 and 0.003%.

4,159,919
MOLECULAR BEAM EPITAXY USING PREMIXING

James H. McFee, Colts Neck, and Barry I. Miller, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 16, 1978, Ser. No. 869,779
Int. Cl.[2] H01L *21/203*
U.S. Cl. 148—175 **7 Claims**

1. A molecular beam epitaxy method of growing an epitaxial film of predetermined chemical composition comprising the steps of:

loading a plurality of ovens with predetermined quantities of chemical feedstocks,

preparing a substrate on a sample holder,

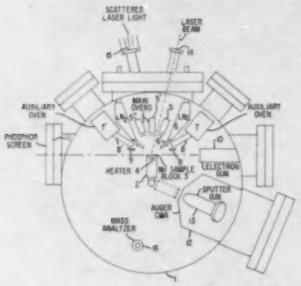
evacuating said apparatus,

heating said sample and said plurality of ovens to predetermined temperatures, and

directing an atomic beam from each of said ovens at said substrate, whereby an epitaxial film is formed on said substrate from said atomic beams:

characterized in that at least one of said plurality of ovens contains a mixture of independently adjustable quantities of two alloying elements in a first predetermined feedstock ratio and in that said first predetermined feedstock

ratio is such that said atomic beam from said at least one oven contains said two alloying elements in a first predetermined flux ratio different from said first predetermined feedstock ratio.

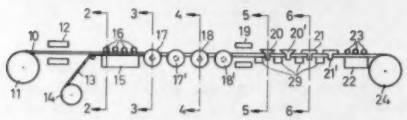


4,159,920

METHOD FOR APPLICATION OF A TAPE OF INSULATING MATERIAL IN THE LONGITUDINAL DIRECTION OF A SUBSTANTIALLY RECTANGULAR ELECTRICAL CONDUCTOR

Gunnar Andersson, and Gunnar Borgstrom, both of Vesteras, Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Apr. 22, 1977, Ser. No. 789,836
Claims priority, application Sweden, Apr. 26, 1976, 7604759
Int. Cl.[2] H01B *13/10*
U.S. Cl. 156—54 **9 Claims**



1. Method of applying a tape of insulating material provided with a heat-fixing binder to a substantially elongated rectangular electrical conductor in the longitudinal direction thereof in apparatus comprising a series of successively positioned operating stations, comprising the steps of:

heating the conductor at a heating station to fix said binder upon contact of said tape with said conductor;

contacting a tape portion with a first conductor side at a contacting station subsequent to said step of heating to fix said tape portion to said conductor;

subsequently successively contacting in turn the respective other tape portions with at least two other respective adjacent conductor sides at successively positioned contacting stations; and

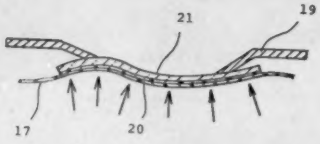
conveying the conductor through said heating station, and conveying the conductor and tape through said contacting station, and said successively positioned contact stations.

4,159,921

METHOD OF CONNECTING AN ELEMENT HAVING MULTIPLE TERMINALS AND A MULTI-LEAD FLEXIBLE CONNECTOR

Akio Inohara, Osaka; Koji Takahashi, Akashi, and Ryoji Inoue, Muro, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 712,044, Aug. 6, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 870,041
Claims priority, application Japan, Aug. 6, 1975, 50-96102
Int. Cl.[2] B29C *27/02*; B32B *31/26*
U.S. Cl. 156—272 **8 Claims**



1. A method for electrically connecting two substrates at least one of which is flexible comprising the steps of: superimposing a first flexible substrate onto a second substrate in such a manner that electrode patterns formed on both substrates confront each other;

supporting the two substrates on one surface of a flexible film in such a manner that the first flexible substrate is sandwiched between the second substrate and the film surface;

applying a predetermined gas pressure to the other surface of the film while retaining said substrates against said film by pressure along a peripheral portion only of said second substrate; and

applying heat energy to the substrates to connect said electrode patterns.

4,159,922

ACCELERATED PROCESS FOR CAUSTICIZATION OF KRAFT GREEN LIQUOR

David R. Cosper, Downers Grove, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Oct. 12, 1978, Ser. No. 950,767
Int. Cl.[2] D21C *11/04*
U.S. Cl. 162—30 K **5 Claims**

1. In the causticization conversion process of Kraft green liquor to white liquor by the reaction of calcium hydroxide and sodium carbonate yielding sodium hydroxide and calcium carbonate, the improvement which comprises using as an additive reagent to increase the causticization conversion of the Kraft green liquor one member of the group selected from nitrilotris(methylenephosphonic acid), 2-phosphonobutane-1,2,4-tricarboxylic acid, and hexamethylenediaminetetrakis(-methylenephosphonic acid) in a dosage of 0.5–2.0 weight percent based on calcium carbonate (theoretical).

4,159,923

KINETIC ASSAY FOR INORGANIC PHOSPHATES AND COMPOSITION THEREFORE

Kenneth J. Pierre; Ker-Kong Tung, and Henriette Nadj, all of Vista, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Division of Ser. No. 758,518, Jan. 11, 1977, Pat. No. 4,097,336, which is a continuation-in-part of Ser. No. 657,976, Feb. 13, 1976, Pat. No. 4,036,697. This application Dec. 12, 1977, Ser. No. 859,412
Int. Cl.[2] G01N *31/14, 33/16*
U.S. Cl. 435—15 **18 Claims**

1. A reagent system for an inorganic phosphate assay comprising:

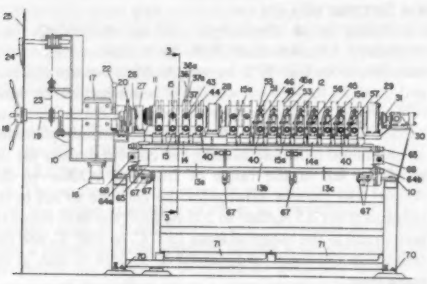
(a) maltose;
(b) maltose phosphorylase;
(c) a co-enzyme selected from a group consisting of beta-nicotinamide-adenine dinucleotide, beta-nicotinamide-adenine dinucleotide phosphate, and mixtures thereof;
(d) glucose-6-phosphate dehydrogenase;
(e) beta-D-phosphoglucomutase; wherein the above are present in amounts such that the inorganic phosphate to be assayed is the limiting component, and
(f) a non-phosphate buffer having a pH of from about 6 to about 8.

13. An inorganic phosphate assay comprising:
(a) performing coupled reactions, at a pH of from about 6 to about 8, which comprise:
(i) reacting maltose with an inorganic phosphate specimen in the presence of maltose phosphorylase to form glucose and β-D-glucose-1-phosphate;
(ii) reacting β-D-glucose-1-phosphate in the presence of β-D-phosphoglucomutase to form glucose-6-phosphate; and
(iii) reacting glucose-6-phosphate in the presence of glucose-6-phosphate dehydrogenase and a co-enzyme selected from a group consisting of β-nicotinamide-adenine dinucleotide, β-nicotinamide-adenine dinucleotide phosphate and mixtures thereof to form the reduced form of said co-enzyme and 6-phosphogluconate; and
(b) measuring the production of said reduced co-enzyme, wherein the inorganic phosphate being measured is the limiting component and wherein a non-phosphate buffer is used to control said pH.

4,159,924
COMBINED CONTROL DEVICE FOR THE OPERATION OF COKE OVEN BATTERIES TO EFFECT SWITCHING OF THE REGENERATIVE HEATING SYSTEM FROM ONE GROUP OF FLUES TO ANOTHER AND FOR CONVERTING FROM ONE HEATING GAS TO ANOTHER

Otto Lemke, Recklinghausen, and Manfred Krause, Herten-Langebochum, both of Fed. Rep. of Germany, assignors to Firma Carl Still Recklinghausen, Fed. Rep. of Germany

Filed Aug. 15, 1977, Ser. No. 824,697
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637314
Int. Cl.² C10B *5/16, 21/14, 21/06*
U.S. Cl. 202—142 **9 Claims**

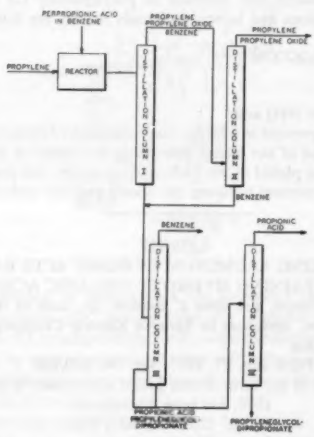


1. A combined control device for the operation of coke oven batteries, including both a part for converting from heating from a strong gas to a lean gas, and vice versa, and a second part for switching the regenerative heating system from one group of heating flues to another, comprising a support frame, a single rotary switching control cylinder rotatably mounted on said frame, a rotary conversion control cylinder rotatably mounted on said frame alongside, and concentric with, said switching control cylinder, means mounting said rotary conversion control cylinder for both rotation and axial displacement into and out of engagement with said rotary switching control cylinder, said rotary conversion control cylinder being rotatable with said rotary switching control cylinder when they are interengaged, coupling means for coupling said rotary conversion control cylinder and said rotary switching control cylinder together for combined rotation together, drive means driving at least one of said rotary switching control cylinder and said rotary conversion control cylinder, a plurality of axially spaced, circumferentially arranged cams on said rotary switching control cylinder and said rotary conversion control cylinder a plurality of switching valves for the switching of the regenerative heating system from one group of heating flues to the other arranged in spaced axial location in respect to and alongside of said rotary switching control cylinder in lateral alignment with and of a number corresponding to said cams on said rotary switching control cylinder, a plurality of converting operation valves arranged in spaced axial relationship in respect to and alongside said rotary conversion control cylinder in lateral alignment with and of a number corresponding to said cams on said rotary conversion control cylinder, follower means mounted on said frame engaged with lateral surfaces of respective ones of said cams on said rotary switching control cylinder and with said switching valves for selectively operating said switching valves and engaged with lateral surfaces of respective cams on said rotary conversion control cylinder and with said converting operation valves for selectively operating said converting operation valves.

4,159,925
PROCESS FOR ISOLATING PROPYLENE GLYCOL DIESTERS IN THE PREPARATION OF PROPYLENE OXIDE

Gerd Schreyer; Rolf Wirthwein, both of Hanau; Karl-Hermann Reissinger, Leverkusen, and Jörg Krekel, Essen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, both of, Fed. Rep. of Germany

Continuation of Ser. No. 678,827, Apr. 28, 1976, abandoned.
This application Dec. 9, 1977, Ser. No. 858,319
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1975, 2519291
Int. Cl.² B01D *3/14;* C07D *301/02*
U.S. Cl. 203—28 **10 Claims**



1. In a process for the production of propylene oxide wherein propylene is contacted with percarboxylic acid in an organic solvent to produce a reaction mixture comprising, in the solvent, 1–50 weight percent of propylene oxide and 1–50 weight percent of the carboxylic acid corresponding to the percarboxylic acid, propylene, and as by-product, up to 25 mol percent based upon the amount of propylene oxide of a mixture

of propylene glycol, propylene glycol monocarboxylate and propylene glycol dicarboxylate, the carboxylate group of the by-product being of said carboxylic acid, said solvent being present in an amount of 20 to 90 weight percent, the boiling point of the solvent being lower than that of the carboxylic acid and higher than of propylene oxide, distilling the reaction mixture in a first distillation zone into an overhead fraction rich in propylene oxide and propylene and a bottoms fraction rich in the carboxylic acid, the by-product, and the solvent, the improvement which comprises, for the recovery of the by-product as propylene glycol dicarboxylate, in a second distillation zone, distilling the bottoms fraction at a pressure of 1.5–6 bars, a sump temperature of 130°–250° C., a reflux ratio of 0.2–10 and an average sump residence time of 10–90 minutes to form propylene glycol dicarboxylate and taking overhead a fraction rich in the solvent and a bottoms fraction rich in the carboxylic acid and the so-formed propylene glycol dicarboxylate virtually only propylene glycol dicarboxylate is formed under said distillation conditions and recovering propylene glycol dicarboxylate from the bottoms fraction of the second distillation zone.

4,159,926

NICKEL PLATING

Clive Barnes, and John J. B. Ward, both of Wantage, England, assignors to BNF Metals Technology Centre, England

Filed Nov. 30, 1977, Ser. No. 856,158

Claims priority, application United Kingdom, Dec. 3, 1976, 50607/76

Int. Cl.[2] C25D *3/12*

U.S. Cl. 204—49 **7 Claims**

1. A method of electrodepositing nickel on an object having a metallic surface, which method comprises providing a nickel electroplating bath consisting essentially of, in aqueous solution at a pH of from 4.0 - 6.5:

Constituent	Molar Concentration
Nickel ions	at least 0.25
Chloride	at least 0.25
Sulphate (optional)	less than 0.25

and a weak complexant for the nickel selected from citrate, glutamate, anions and lactones of polyhydroxy C5 and C6 acids, and anions and lactones of acids having the formula

$$X(C_nH_{2n})COOH$$

where

X is OH or NH_2 and

n is 1 to 5, present at a Molar concentration of from 1.0 to 4.0 times that of the nickel, providing the object as the cathode to be plated in the bath, and an anode, and passing an electric current between the anode and the cathode.

4,159,927

ANODIZING ALUMINUM IN BORIC ACID BATH CONTAINING HYDROXY ORGANIC ACID

Walter J. Bernard, and John J. Randall, Jr., both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jun. 27, 1977, Ser. No. 810,130

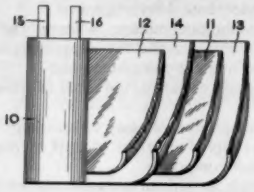
The portion of the term of this patent subsequent to Sep. 12, 1995, has been disclaimed.

Int. Cl.[2] C25D *11/10, 11/08*

U.S. Cl. 204—58 **9 Claims**

1. A process for producing an aluminum electrolytic capacitor anode having thereon a dielectric barrier oxide layer modified by the incorporation therein of no more than 1% of carbonaceous material calculated as carbon, including the step of

producing said modified barrier layer by carrying out the usual anodization step on etched foil in a conventional boric acid electrolyte containing 5×10^{-5} to 1.5×10^{-2} mols/liter of an additive chosen from the group consisting of alpha- and ortho- hydroxycarboxylic acids containing two through seven carbon atoms and salts of these acids, thus producing said layer modified by the incorporation



therein of no more than 1% carbonaceous material calculated as carbon,

and subsequently processing the anode in the usual manner and assembling it in an electrolytic capacitor.

4,159,928

PROCESS FOR PRODUCTION OF ALUMINUM

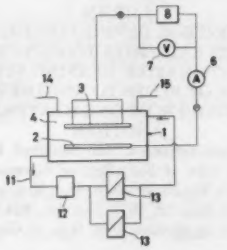
Yoshishige Tsumura, Tokyo, Japan, assignor to Mitsui Aluminium Co., Ltd., Tokyo, Japan

Division of Ser. No. 798,457, May 19, 1977, Pat. No. 4,108,741.

This application Apr. 24, 1978, Ser. No. 899,460

Int. Cl.[2] C25C *3/06*; C25D *1/00*

U.S. Cl. 204—67 **7 Claims**



1. A process for the production of aluminum by low-temperature electrolysis of aluminum chloride, which process comprises: a first step of:

electrolyzing in an electrolytic cell an electrolytic bath containing not less than 50% by weight of aluminum chloride, from 0 to 30% by weight of potassium chloride and from 10 to 40% by weight of sodium chloride while using as the anode one member selected from the group consisting of a tungsten plate, a silicon carbide plate and an aluminum plate and causing the current density for the anode to fall in the range of from 0.5 A/dm^2 to 200 A/dm^2, the current density for the cathode to fall in the range of from 0.5 A/dm^2 to 200 A/dm^2, the bath temperature to fall in the range of from 120° C. to 250° C. and cell voltage in the range of from 2.7 V to 11.4 V and, at the same time,

circulating the bath by causing it to flow out of the electrolytic cell, then to pass through a filter to thereby separate filter residue therefrom and subsequently to flow into the cell,

so as to educe aluminum on the cathode by the electrolysis and cause the educed aluminum to be split from the cathode by the shocks of the outflow of the bath from and the inflow of the bath into the cell and to form in the bath a muddy substance to be filtered by the filter and collected as filter residue in the circulation of the bath; and a second step of

melting the collected filter residue to give rise to an alumi-

num phase and a fusion flag phase and isolating the aluminum phase.

4,159,929

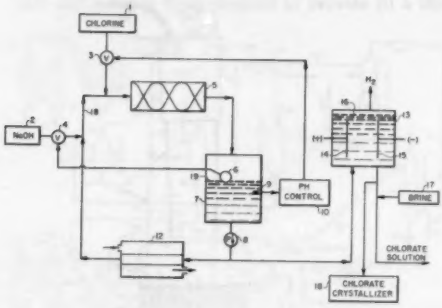
CHEMICAL AND ELECTRO-CHEMICAL PROCESS FOR PRODUCTION OF ALKALI METAL CHLORATES

Morris P. Grotheer, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed May 17, 1978, Ser. No. 906,796

Int. Cl.[2] C25B *1/14, 1/26*

U.S. Cl. 204—95 **13 Claims**



1. A continuous process for the preparation of alkali metal chlorate-containing solutions which comprises (I) preparation of a reaction product (c) comprising an aqueous solution of an alkali metal chloride, alkali metal chlorate and alkali metal hypochlorite, said reaction product (c) prepared by mixing and chemically reacting (a) a solution comprising alkali metal hydroxide and (b) chlorine in an amount sufficient to maintain the pH of the reaction mixture at about 5 to 7.5 without further dilution and acidification during the process and to promote conversion of the alkali metal hypochlorite to alkali metal chlorate, the reactant (a) being prepared by diluting the alkali metal hydroxide with at least a portion of reaction product (c), and (II) electrolyzing at least a portion of reaction product (c) in an electrolysis cell for preparation of a solution having at least 335 grams per liter alkali metal chlorate and at least 100 grams per liter alkali metal chloride.

4,159,930

PROCESS FOR RECOVERING HEAVY METAL IONS FROM DILUTE AQUEOUS SOLUTION

David J. Degenkolb, Granada Hills, and Fred J. Scobey, Hollywood, both of Calif., assignors to De luxe General, Incorporated, Los Angeles, Calif.

Continuation-in-part of Ser. No. 826,571, Aug. 22, 1977, abandoned. This application Sep. 19, 1978, Ser. No. 943,839

Int. Cl.[2] C01G *5/00*; C25C *1/20*; C01G *37/14, 49/00*

U.S. Cl. 204—111 **16 Claims**

1. The process of recovering an anionic complex ion selected from the group consisting of silver as thiosulfate; iron as ferricyanide, iron as ferrocyanide, and chromium as dichromate from a dilute aqueous solution having a concentration of said ion within the range of 0.04 and 25 parts per million in the presence of thiosulfate ion at a concentration in excess of 30 to 1 with respect to the concentration of said anionic complex ion, that comprises the process steps of;

(a) flowing said solution into contact with an anion ion exchange resin selected from the group consisting of a cross-linked polystyrene resin with quaternary ammonium functional groups, an epoxy-amine, a polyacrylic, and a polyfunctional amine phenolic resin,

(b) flowing the effluent of said solution from said resin,

(c) subsequently flowing into contact with said resin a concentrated solution in excess of 17% concentration of a compound selected from the group consisting of ammonium chloride, sodium chloride, sodium bromide, sodium iodide, sodium thiosulfate and ammonium thiosulfate at a pH in excess of 7 to recover the said anionic ion from said resin, and

(d) isolating the said anionic ion from said concentrated solution of a compound as a solid.

16. The process of recovering a silver as thiosulfate anionic complex ion from a dilute aqueous solution having a concentration of said ion within the range of 0.04 and 25 parts per million in the presence of thiosulfate ion at a concentration in excess of 30 to 1 with respect to the concentration of said anionic complex ion, that comprises the process steps of;

(a) flowing said solution into contact with an anion ion exchange resin selected from the group consisting of a cross-linked polystyrene resin with quaternary ammonium functional groups, an epoxy-amine, a polyacrylic, and a polyfunctional amine phenolic resin,

(b) flowing the effluent of said solution from said resin,

(c) subsequently flowing into contact with said resin a concentrated solution in excess of 17% concentration of a compound selected from the group consisting of ammonium chloride, sodium chloride, sodium bromide, sodium iodide, sodium thiosulfate and ammonium thiosulfate at a pH in excess of 7 to recover the said anionic ion from said resin, and

(d) electroplating out metallic silver from said concentrated solution after flowing the same from said resin.

4,159,931

COLOR-TELEVISION SCREEN-COATING ROOM

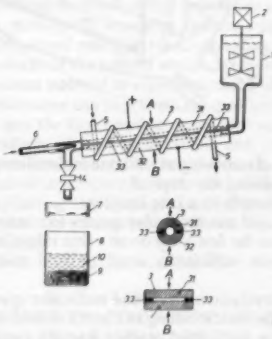
Uwe Viohl, Aichwald, and Rolf Zondler, Stuttgart-Neugereut, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 1, 1978, Ser. No. 901,369

Claims priority, application Fed. Rep. of Germany, May 7, 1977, 2720668

Int. Cl.[2] C25C *1/00*; C02C *5/12*

U.S. Cl. 204—152 **6 Claims**



1. A method of separating a red rare-earth phosphor of a color-television picture tube from the sediment in the drain channels of a screen-coating room, which sediment contains, in addition to various impurities, zinc-sulfide-base and zinc-cadmium-sulfide-base green and blue phosphors, characterized by the following steps:

a. removing coarse foreign matter by sieving;

b. washing out constituents soluble in water, such as polyvinyl alcohol, ammonium bichromate, etc.;

c. heating to approximately 450° C., thus volatilizing further organic constituents;

d. cooling down and pulverizing;

e. stirring into an aqueous ammonium-halide solution;

f. electrolysis during passage between graphite electrodes;

g. filtering off sulphur and cathode deposit;

h. collecting in a tank, allowing solid constituents to deposit, and decanting the liquid;
i. optionally repeating the steps (c) to (h), and
k. carrying out one of the known methods of regenerating only slightly contaminated rare-earth phosphors.

4,159,932

PROCESS FOR ACTIVATING CHITIN BY MICROWAVE TREATMENT AND IMPROVED ACTIVATED CHITIN PRODUCT

Quintin P. Peniston, Rte. 7, Box 7710, Bainbridge Island, Wash. 98110, and Edwin L. Johnson, Rte. 5, Box 4246, Issaquah, Wash. 98027

Filed Jan. 3, 1978, Ser. No. 866,792
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—158 R **7 Claims**

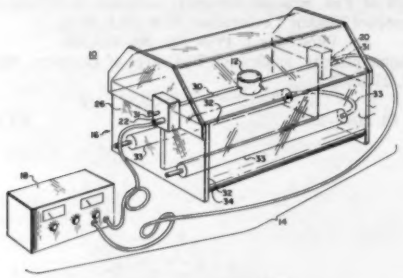
1. A process for enhancement of the reactivity of chitin, that comprises, conditioning the chitin with one of water or a strong alkali mixable with the chitin, and radiating the conditioned chitin with microwave energy.

4,159,933

SAMPLE CONCENTRATOR

William B. Allington, deceased, late of Lincoln, Nebr. (by Richard T. Emery, executor); James W. Nelson, Lincoln, Nebr.; Arthur L. Cordry, Lincoln, Nebr.; Gail A. McCullough, Lincoln, Nebr., and Don E. Mitchell, Lincoln, Nebr., assignors to Instrumentation Specialties Company, Lincoln, Nebr.

Filed Mar. 25, 1977, Ser. No. 781,176
Int. Cl.[2] G01N *27/40, 27/26, 27/28*
U.S. Cl. 204—180 R **9 Claims**



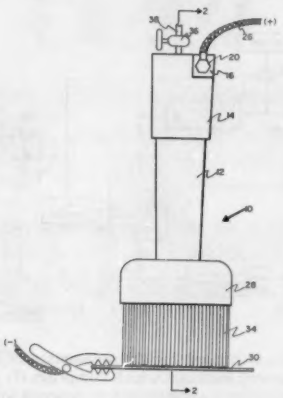
1. A method of removing at least one molecular species from a sample, comprising the steps of:
moving the sample to a first location;
transporting said one molecular species to a second location spaced from the first location on a first side of a membrane having pores sufficiently small to hold said molecular species;
said step of transporting said one molecular species including the steps of establishing an electrical field between said first location and a third location spaced a greater distance from said first side of said membrane than said first location and establishing a path for ion flow between the third location and the second side of said membrane, whereby the one molecular species is moved by electrophoresis from the sample to a position against the first side of the membrane;
removing at least a portion of the first molecular species from the first side of the membrane;
the step of transporting said one molecular species to a second location including the step of transporting said one molecular species to a second location spaced from the first location on a first side of a first membrane;
said step of moving the sample to a first location including the step of placing said sample on a first side of a second membrane; and
the step of establishing an electrical field between the first location and a third location including the step of establishing an electrical potential between the second side of the second membrane and the second side of the first membrane.

4,159,934

SELECTIVE PLATING BRUSH APPLICATOR

Igor V. Kadija, 1210 Davis Dr., NW., Cleveland, Tenn. 37311

Filed Dec. 5, 1977, Ser. No. 857,320
Int. Cl.[2] C25D *17/14, 17/00*
U.S. Cl. 204—224 R **9 Claims**



1. A selective plating brush applicator comprising:
(a) an electrically conducting core:
(b) a holding means attached to one end of the core for holding the plating brush;
(c) a plating current application means attached to the core for applying a plating current to the core;
(d) a brush head attached to the other end of the core for applying a selective plating solution to a workpiece, wherein the brush head is comprised of anodic electrically conducting flexible fibers and electrically non-conducting fibers, wherein the non-conducting fibers are attached to the ends of the conducting fibers, and the conducting fibers are conductively attached to the core, wherein the conducting and non-conducting fibers are positioned in the brush head in such a manner that when the plating brush is used to apply the plating solution to the workpiece the conducting fibers do not come in contact with the workpiece; and
(e) a plating solution supply means for supplying the plating solution to the brush head;
whereby when the brush head is placed in contact with the workpiece, plating current applied to the conducting core and workpiece and plating solution supplied to the brush head, the workpiece is selectively plated.

4,159,935

CONVERSION OF HYDROCARBONACEOUS BLACK OILS

Norman H. Scott, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

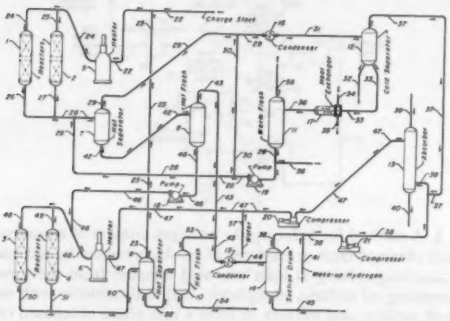
Filed Aug. 30, 1978, Ser. No. 938,183
Int. Cl.[2] C10G *37/02, 37/06*
U.S. Cl. 208—59 **12 Claims**

1. A process for the conversion of a black oil charge stock, of which at least 10.0% by volume boils above about 1050° F., which process comprises the sequential steps of:
(a) reacting said charge stock and hydrogen, in a first catalytic reactor system, at a temperature above about 700° F. and a pressure greater than about 1000 psig.;
(b) separating the resulting first reaction product effluent, in

a first separation zone, under substantially the same pressure and a temperature not substantially exceeding 750° F., to provide a first vaporous phase and a first liquid phase;

(c) cooling said first vaporous phase to a temperature in the range of about 50° F. to about 150° F., and separating the cooled vaporous phase, in a second separation zone at substantially the same pressure as said first separation zone, to provide (i) a hydrogen-rich second vaporous phase and, (ii) a methane-containing second liquid phase;

(d) increasing the temperature of said second liquid phase, and separating the heated liquid phase, in a third separation zone at a substantially reduced pressure, said temperature and pressure being selected to provide (i) a third



liquid phase and, (ii) a third vaporous phase containing at least about 70.0% of the methane contained in said second liquid phase;

(e) admixing a first portion of said third liquid phase with said first vaporous phase and a second portion with said first reaction product effluent;

(f) separating said first liquid phase at substantially the same temperature, in a fourth separation zone under a substantially reduced pressure below about 1000 psig., to provide (i) a fourth liquid phase and, (ii) a fourth vaporous phase; and,

(g) further reacting said fourth liquid phase with hydrogen, in a second catalytic reactor system at an increased pressure above about 1000 psig.

4,159,936

PROCESS FOR HYDROGENIZED RECONDITIONING OF CRUDE OIL OR RESIDUES DERIVED THEREFROM INTO SATURATED LIGHT HYDROCARBONS

Rainer Dorn, Bräuningshof; Christian Koch; Kurt Reiter, both of Erlangen, and Konrad Künstle, Röttenbach, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Fed. Rep. of Germany

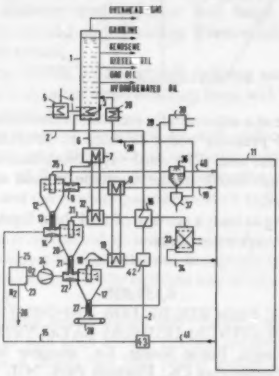
Filed Sep. 28, 1977, Ser. No. 837,110

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1976, 2645132

Int. Cl.[2] C10G *13/00, 37/00*

U.S. Cl. 208—93 **4 Claims**

1. A process for the refining of petroleum which comprises subjecting crude petroleum to fractional distillation in a distillation zone under substantially atmospheric pressure to separate the crude oil into more volatile fractions and less volatile distillate bottoms, maintaining a sufficiently low temperature in the distillation zone to cause the distillate bottoms to separate in a fraction of at least 50% of the crude oil, passing the distillate bottoms into a first reaction zone into which is also introduced hydrogen at a temperature above 700° C. in intimate contact with the distillate bottoms to hydrogenate the distillate bottoms to a major amount of substantially saturated normally liquid hydrocarbons with the concomitant production of a lesser amount of solid carbonaceous material, and minor amounts of noncondensable components including normally gaseous hydrocarbons and unreacted hydrogen, separating the solid carbonaceous material from the remaining reaction products of hydrogenated oil and noncondensable components, passing the separated solid carbonaceous material into a second reaction zone in intimate contact with a mixture, at a temperature in excess of 750° C., of steam, gaseous hydrocarbons having less than 3 carbon atoms, and the gaseous combustion products of a third separator containing CO_2, O_2 and CO, to produce as reaction products a reduced amount of solid carbonaceous material, consumption of the O_2, reduction in H_2O content, with production of H_2 and increased amounts of CO and CO_2, separating the remaining solid carbonaceous material from the reaction products of the second reaction zone, passing said remaining carbonaceous material into a third reaction zone into which is introduced excess oxygen to effect substantially complete combustion of the carbonaceous mate-



rial to produce gaseous combustion products containing CO_2, O_2 and CO and a solid residue containing unburned material and ash, separating in said third separator the gaseous combustion products from the solid residue containing unburned material and ash, passing the separated gaseous combustion products into said second reaction zone, extracting heat from the reaction products of the second reaction zone separated from the carbonaceous material to superheat said steam entering the second reaction zone and to preheat the distillate bottoms prior to entrance into the first reaction zone, cooling the separated reaction products of hydrogenated oil and noncondensable components to condense the hydrogenated oil, separating the hydrogenated oil condensate from the noncondensable components, and returning the hydrogenated oil condensate to the distillation zone for fractional distillation into fractions of different volatility.

4,159,937

MIXED-PHASE REACTION PRODUCT EFFLUENT SEPARATION PROCESS

Norman H. Scott, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 30, 1978, Ser. No. 938,182

Int. Cl.[2] C10G *37/06, 37/02*

U.S. Cl. 208—104 **8 Claims**

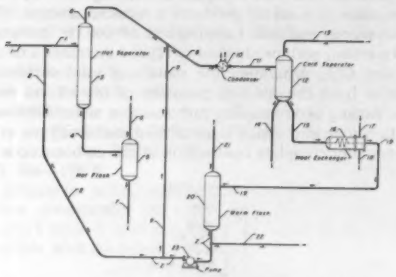
1. A process for separating a mixed-phase hydrocarbonaceous reaction product effluent, said product effluent (1) resulting from the conversion of a hydrocarbon charge stock boiling above a temperature of about 400° F. and, (2) containing hydrogen to be recycled to the conversion zone, normally liquid hydrocarbons and normally vaporous hydrocarbons, which separation process comprises the sequential steps of:

(a) separating said product effluent, in a first separation zone at substantially the same pressure as said effluent, to provide (i) a first liquid phase and, (ii) a first vaporous phase;

(b) cooling said first vaporous phase to a temperature in the

range of about 50° F. to about 150° F., and separating the cooled vaporous phase, in a second separation zone at substantially the same pressure as said first separation zone, to provide (i) a hydrogen-rich second vaporous phase and, (ii) a methane-containing second liquid phase;

(c) increasing the temperature of said second liquid phase, and separating the heated liquid phase, in a third separation zone at a substantially reduced pressure, said temperature and pressure being selected to provide (i) a third liquid phase and, (ii) a third vaporous phase containing at least about 70.0% of the methane in said second liquid phase; and,



(d) admixing at least a portion of said third liquid phase with said first vaporous phase.

4,159,938

START-UP PROCEDURE FOR REFORMING WITH PLATINUM-IRIDIUM CATALYSTS

William B. Lewis, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 23, 1977, Ser. No. 863,865

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—139 **18 Claims**

1. In a process for catalytically reforming a hydrocarbon feed boiling within the gasoline range by contacting said feed at reforming conditions with a bed of catalyst comprised of platinum, iridium and halide components composited with inorganic oxide, the improvement which comprises

contacting and pretreating said catalyst at temperatures ranging from about 600° F. to about 1000° F., prior to contact of said hydrocarbon feed with said catalyst, with hydrogen, to reduce the platinum and iridium components, equilibrating and wetting said catalyst with water, and maintaining said catalyst in wetted condition throughout said pretreatment while adding an admixture comprised of water, halogen, and hydrogen sulfide, and thereafter

introducing said hydrocarbon feed into contact with said catalyst at reforming conditions to initiate the catalytic reforming reaction.

4,159,939

HYDROCARBON CONVERSION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 833,332, Sep. 14, 1977. This application May 26, 1978, Ser. No. 910,301

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—139 **21 Claims**

1. A catalytic process for conversion of a hydrocarbon which comprises contacting said hydrocarbon at hydrocarbon conversion conditions with a catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state, and of a tantalum component.

4,159,940

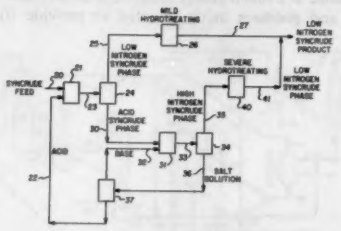
DENITROGENATION OF SYNCRUDE

Robert H. Smith, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 803,834, Jun. 6, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 883,765

Int. Cl.[2] C10G *23/00, 17/06*

U.S. Cl. 208—254 H **5 Claims**



1. A method for reducing the nitrogen content of a syncrude feed obtained from at least one of oil shale, tar sands, and coal, comprising mixing at least one acid selected from the group consisting of sulfuric, phosphoric, and hydrochloric with said feed, settling said mixture to form a first phase composed of a syncrude low in nitrogen and a second phase composed of acid and a syncrude high in nitrogen, separating said first and second phases from each other, neutralizing said second phase with a base to form a salt with the acid in said second phase, settling said neutralized second phase to form a high nitrogen syncrude phase and a salt solution, separating said salt solution from said high nitrogen syncrude phase, and catalytically hydrotreating said high nitrogen syncrude phase to remove nitrogen and produce a product composed of syncrude low in nitrogen, said first phase and said product containing at least 20 percent by weight lower nitrogen concentration than said high nitrogen syncrude phase.

4,159,941

SEPARATOR

Hugh E. Avery, Jr., Houston, Tex., assignor to Allied Industries, Inc., Houston, Tex.

Continuation of Ser. No. 688,678, May 21, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 848,028

Int. Cl.[2] B07B *7/04*

U.S. Cl. 209—3 **3 Claims**

1. Apparatus for separating a pellet-like product from fines mixed therewith, comprising:

a substantially symmetrical housing having a vertical axis of symmetry, an upper fines outlet, a lower product outlet, and an intermediate cylindrical portion,

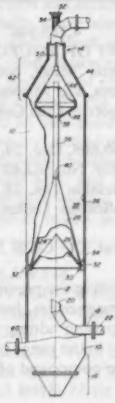
an inlet conduit for receiving quantities of said product and fines, along with a pressurized propellant fluid, said inlet extending into said cylindrical housing portion and having an upwardly facing inlet nozzle intermediate said fines outlet and said product outlet,

an imperforate conical impact baffle supported within said housing and having a concave impact surface facing said inlet nozzle spaced apart from said inlet nozzle to allow vertical entry of said product and fines and located to intercept substantially the entirety of said product issuing from said inlet nozzle, said impact baffle having an axis of symmetry coincident with the vertical axis of symmetry of said housing, said impact baffle sized to define with said cylindrical housing portion an annular flow orifice for said propellant fluid between said baffle and said housing,

a second conical baffle supported in said housing above said

impact baffle aligned with said cylindrical housing portion and tapered in an upward direction to define, with said cylindrical housing portion, an annular flow conduit having a conduit cross section that gradually increases in area in a direction away from, and that communicates with, said annular flow orifice, said baffles supported with their circumferences substantially aligned at the annular flow orifice,

a valve means for controlling the exit velocity of said fines and propellant fluid through said fines outlet, said valve



means including an inwardly tapering portion of said housing adjacent said fines outlet and an imperforate body within said housing having an exterior surface shaped to substantially match the shape of the tapering housing portion, rod means extending from the second baffle to the valve means for supporting the imperforate body, and means for moving said body to adjust the annular gap between said body and said tapering housing portion while also supporting said body; and

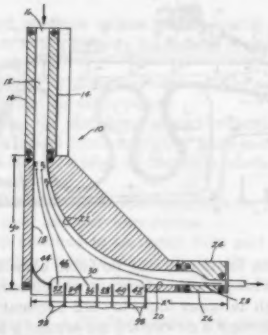
a wash air inlet in the wall of said housing intermediate said impact baffle and said product outlet.

4,159,942

METHOD AND APPARATUS FOR SEPARATING PARTICLES

Raymond T. Greer; Kenneth G. McConnell, and Arthur Akers, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Sep. 22, 1977, Ser. No. 835,502
Int. Cl.[2] B07B *7/08, 11/04*
U.S. Cl. 209—143 **17 Claims**



1. Apparatus for separating by density a plurality of particles which are dispersed in a fluid stream, said apparatus comprising:

a housing having a plurality of walls defining a separation chamber, said housing having spaced apart inlet and outlet openings for permitting said fluid stream to enter into said chamber and exit from said chamber respectively;

said outlet opening being in communication with an outlet passageway;

an elongated inlet passageway connected to said inlet opening for introducing said fluid stream into said chamber in a first line of direction of fluid flow;

said outlet opening being located laterally from said first line of direction of fluid flow whereby said fluid stream changes direction as it passes through said chamber and out through said outlet opening;

said housing having a collector wall defining one boundary of said chamber, said collector wall being spaced from said inlet opening and extending transversely to said first line of direction;

said housing having a curved wall defining another boundary of said chamber and extending from said inlet opening to said outlet opening;

a collector movably mounted to said collector wall for movement in a direction transverse to said first line of direction of fluid flow, said collector being adapted to capture and carry away particles which strike said collector;

power means connected to said collector for causing selective movement of said collector to a plurality of positions along a line transverse to said first line of direction of fluid flow; and

velocity sensing means within said chamber for sensing the velocity of said fluid stream, control means connected to said sensing means and said power means and being responsive to varying velocities of said fluid stream for causing said power means to selectively move said collector to a plurality of preselected positions each of which corresponds to a different fluid velocity.

4,159,943

FROTH FLOTATION OF ORES USING HYDROCARBYL BICARBONATES

Vojislav Petrovich, 1935 W. Schiller St., Chicago, Ill. 60622

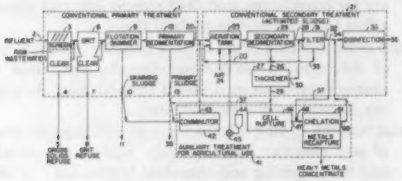
Filed Feb. 16, 1978, Ser. No. 878,385
Int. Cl.[2] B03D *1/02*
U.S. Cl. 209—166 **3 Claims**

1. A method of beneficiating ores selected from the group of earth alkaline metal carbonates and sulfates of magnesium calcium, strontium, and barium, also ores selected from the group of base metal carbonates, silicates, sulfates, sulfides, of copper, silver, lead, and zinc, as well as ores selected from the group of heavy metal oxides, carbonates, sulfides, arsenides of nickel, cobalt, oxides, carbonates of iron, and manganese by froth flotation process to produce a froth concentrate of desired metal value leaving gangue minerals, such as silica and the alumino silicates in tailing which comprises; effecting the froth flotation of the said metalic ores and nonmetallic minerals by means of alkali or ammonium salts of alkyl, alkaryl, aralkyl, aryl, cyclo, cycloalkyl bicarbonates or di-bicarbonates as promoter-collectors, which make collecting and floating the desired metal values at a pH value of the flotation circuit from 6 to 8; said hydrocarbyl bicarbonates forming mineral-hydrocarbon complexes which form bubbles provided by agitating the pulp of mineral slurry in the presence of air; and recovering a froth concentrate relatively rich in the desired metal value, leaving tailing relatively poor in the desired metal value.

4,159,944
WASTEWATER ENERGY RECYCLING METHOD

Lennart G. Erickson, 1070 E. Meadow Cir., Palo Alto, Calif. 94303, and Howard E. Worne, Lyon Industrial Pk., Rte. 73, Berlin, N.J. 08009

Filed Feb. 13, 1978, Ser. No. 877,195
Int. Cl.[2] C02C *1/06*
U.S. Cl. 210—6 9 Claims

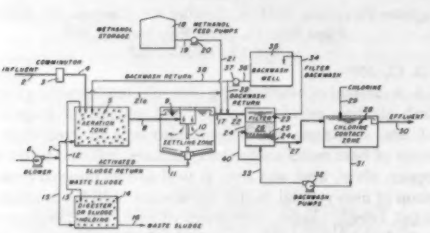


1. In the processing of wastewater by primary and secondary treatments, which includes a biochemical reaction according to the activated sludge process wherein the wastewater is separated into a sludge component and a clarified effluent, the improvement for salvaging and recycling the valuable components thereof comprising: comminuting primary sludge separated from said primary treatment and adding the comminuted mass to the organic input for said secondary treatment, subjecting sludge separated from the biochemical reaction of said secondary treatment to sufficient pressure to substantially rupture all of the walls of cells in said sludge and discharge the contents of the cells as part of a colloidal suspension, combining said colloidal suspension with the clarified effluent, and contacting said clarified effluent and colloidal suspension with a metal chelating substrate to remove heavy metals therefrom.

4,159,945
METHOD FOR DENITRIFICATION OF TREATED SEWAGE

Elton S. Savage, Wexford, Pa., assignor to Dravco Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 302,398, Oct. 31, 1973, abandoned, which is a division of Ser. No. 68,917, Sep. 2, 1970, Pat. No. 3,709,364. This application Jan. 31, 1974, Ser. No. 438,466
Int. Cl.[2] C02C *1/06*
U.S. Cl. 210—8 7 Claims



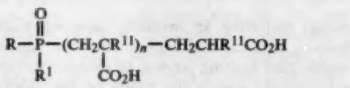
1. The process for treating wastewater which contains nitrates in solution and also suspended solids, which comprises flowing the wastewater downwardly through a deep bed filter having a filter media comprising hard, gravel-like material comprised of particles in the size range between 1 mm and 6 mm providing between them voids capable of releasably entrapping bubbles of nitrogen gas and thereby provide additional filtering media to said bed, said deep bed filter being innoculated with bacteria capable of decomposing the dissolved nitrates and releasing nitrogen gas into the bed and thereby generate nitrogen bubbles that are so entrapped in said media and which thereby effectively reduces the nitrate content of said water while solid particles in the wastewater are at the same time being trapped in the filter, intermittently backwashing the filter with clean water to remove entrapped bubbles and the gas contained therein and wash away solid particles arrested in the passage of the wastewater through the filter and also removing some of said bacteria while still maintaining in the filter bed at all times, both during normal filtering operations and during backwashing, adequate denitrifying bacteria to sustain denitrification activity and nitrogen gas generation upon startup after each backwashing operation.

4,159,946
TREATMENT OF AQUEOUS SYSTEMS

Malcolm J. Smith; Peter Miles, both of Stockport; Norman Richardson, Middleton, and Michael A. Finan, Macclesfield, all of England, assignors to Ciba Geigy (UK) Limited, London, England

Division of Ser. No. 755,605, Dec. 29, 1976, Pat. No. 4,127,483, which is a division of Ser. No. 582,402, May 29, 1975, Pat. No. 4,046,707. This application Jan. 24, 1978, Ser. No. 871,986
Claims priority, application United Kingdom, Jun. 11, 1974, 25853/74
Int. Cl.[2] C02B *5/06*
U.S. Cl. 210—58 7 Claims

1. A method of inhibiting the precipitation of the scale forming salts of calcium, magnesium, barium and strontium from aqueous systems comprising adding to the aqueous system a scale inhibiting amount in the range of 1–200 ppm of a product comprising a telomeric compound of the formula:

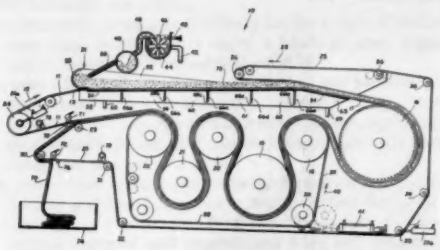


and the salt-forming derivatives thereof, wherein R^{11} is H, CH_3 or C_2H_5, R^1 is a residue —OX wherein X is an alkyl residue having 1–4 carbon atoms or hydrogen, R is hydrogen, an alkyl residue having 1–18 carbon atoms, a cycloalkyl residue having from 5–12 carbon atoms, a phenyl residue or a benzyl residue, and n is a positive integer of at most 100.

4,159,947
DEWATERING SYSTEM

Larry L. Brooks, and David A. McMillon, both of P.O. Box 2323, Birmingham, Ala. 35201

Continuation of Ser. No. 687,377, May 17, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,318
Int. Cl.[2] B01D *33/14*
U.S. Cl. 210—108 11 Claims



1. Apparatus for dewatering flowable aqueous material or the like comprising a first endless porous belt movable along its length through an upper flight toward a rotatable dewatering drum, then through a downward arc around a portion of said dewatering drum, then through a lower return flight in a sinuous path in sequence around the arcuate upper and lower

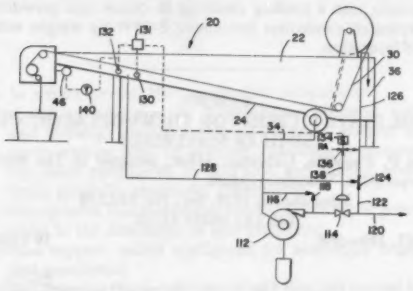
surfaces of a series of rollers, feed means for depositing flowable aqueous material on the upper surface of said first belt at a first position along the upper flight, a second endless porous belt movable along its length toward said dewatering drum into sandwiched relationship with said first endless belt about the material and movable with said first endless belt along the upper flight of said first endless belt toward said dewatering drum and around a portion of said dewatering drum and around the arcuate upper and lower surfaces of said series of rollers, and a third endless belt means movable into sandwiched relationship with said first and second endless belts and the material carried by said first and second endless belts as the first and second endless belts move along the lower return flight for urging the first and second endless belts and the material carried thereby in compression against the surfaces of the series of rollers of said plurality of rollers as said first and second endless belts move through the lower return flight, means for applying tension to said third endless belt means, said third endless belt means and said plurality of rollers being arranged to apply progressively increased pressures to the sandwiched first and second belts and the material carried thereby as the first and second endless belts move around subsequent ones of the series of rollers in the return flight.

4,159,948

BELTLESS VACUUM FILTER

William D. Crowe, San Francisco, Calif., assignor to J. R. Schneider Co., Tiburon, Calif.

Continuation-in-part of Ser. No. 779,715, Mar. 21, 1977, abandoned. This application Mar. 1, 1978, Ser. No. 882,320
Int. Cl.[2] B01D *33/04*
U.S. Cl. 210—111 **21 Claims**



1. A filter apparatus comprising:

wall means including spaced apart side walls forming a receiving tank for dirty liquid to be filtered, a collection tank below said receiving tank for clean filtered liquid and an auxiliary reservoir for clean liquid adjacent said receiving tank;

a fixed inclined pervious means for supporting a layer of movable filter media forming the bottom of said receiving tank;

means for supplying an elongated sheet of filter media to the upper side of said pervious means;

means for sealing the periphery of said collection tank to prevent dirty liquid from migrating from said receiving tank around the side edge of the filter media into said collection tank;

means at the forward end of said apparatus for pulling the filter media over said pervious means;

a suction pump attached to an outlet from said collection tank for reducing pressure therein during the operation of said apparatus to increase the flow of liquid through said filter media;

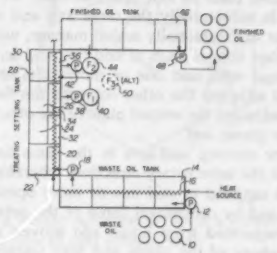
means responsive to a predetermined low pressure level within said collection tank due to accumulation of filtered out material on said filter media for temporarily substantially equalizing the pressure in said collection and receiving tanks and thereafter for automatically controlling said media pulling means to move said media up said inclined pervious support means.

4,159,949

CONTAMINANT REMOVER

Edmon F. Oden, 2611 Stoney Brook, Houston, Tex. 77063

Filed Sep. 28, 1978, Ser. No. 946,551
Int. Cl.[2] B01D *35/18;* C02B *1/02*
U.S. Cl. 210—180 **10 Claims**



1. A system for removing contaminants from a continuous fluid supply, said system including in combination:

a waste oil tank having a plurality of chambers;

a treating and settling tank positioned near said waste oil tank, said treating and settling tank having a plurality of compartments each of which has a trough;

a heating source positioned in said waste oil tank and in each of the troughs of said treating and settling tank to heat the fluid being processed;

pump means for pumping fluid being processed from said waste oil tank to said treating and settling tank;

filter means coupled to said treating and settling tank to remove partially treated fluid from said treating and settling tank; and

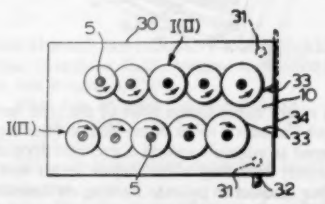
a finished oil tank connected to said filter means for storing fluid after said fluid has passed through said filter means.

4,159,950

FILTER APPARATUS

Sanae Hayashida, 1 Shimomisu-Yamaden, Yoko-Ohji, Fushimi-ku, Kyoto, and Gorou Sasaki, 3-41, Senrioka, 4-chome, Settsu-shi, Osaka, both of Japan

Continuation-in-part of Ser. No. 761,526, Jan. 24, 1977, abandoned. This application Jan. 26, 1978, Ser. No. 872,376
Claims priority, application Japan, Apr. 1, 1976, 51-36770
Int. Cl.[2] B01D *33/24, 33/06, 35/16*
U.S. Cl. 210—330 **8 Claims**



1. A filter apparatus comprising

(A) a container having one or more openings for supplying unfiltered material and one or more exits for removing filtered liquid material;

(B) at least one line of sets of rotatable filter elements disposed within said container, each set comprising
(i) a plurality of circular first plates having a first diameter, each plate having at least one hole at a predetermined distance from the center thereof,
(ii) a plurality of circular second plates having a diameter larger than said first diameter, each plate having at least one hole at said predetermined distance from the center thereof, and being of a size and shape substantially similar to said at least one hole in said first plates,
(iii) a plurality of interleaving circular plates of a third diameter smaller than said first diameter, and
(iv) means for holding said first plate, interleaving plate, and second plate in that order in each set with their centers in substantially the same axis and within said container in substantially sealed manner, whereby said at least one hole of each of said first and second plates are aligned with said one or more exits with one set disposed adjacent the other set with the first plate of one set adjacent the second plate of the other set and in the same plane; and

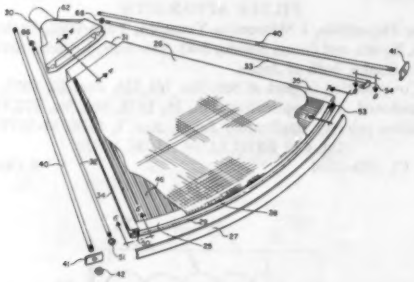
(c) means for moving said sets in the same line of filter elements in the same rotary direction, whereby unfiltered material is supplied to said one or more opening of said container and by centrifugal force of the rotating plates sludge is separated from liquid and moved toward the outer periphery of the plates and then transferred from one plate to the next down the line and accumulated toward the end of the line, and filtered liquid material remaining after the separation passes through said at least one hole of said first and second plates and sludge remaining in said filtered liquid material is on the lower next level separated by similar rotating of said plates, moved toward the outer peripheries of the plates, then transferred from plate to plate in a line and accumulated toward the end of the line at said next lower level, with the again filtered liquid material dropping level by level until substantially filtered liquid is removed from said one or more exits.

4,159,951

SECTOR ASSEMBLY

Steven S. Davis, Bountiful, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Jan. 25, 1978, Ser. No. 872,123
Int. Cl.[2] B01D *25/04*
U.S. Cl. 210—331 **9 Claims**



1. In a rotary disc vacuum filter of the type having a disc filter which includes a series of fan-shaped filter sector assemblies secured at intervals around a rotatable supporting shaft, each assembly including a fan-shaped sector body covered with a filter medium to provide filtering on opposing faces of the body and a bell member interconnecting passageways of the body with a conduit formed in the supporting shaft and through which a vacuum is drawn to draw liquid filtered through the filter medium along the passageways and through the bell member to the conduit, as a new article of manufacture, a sector comprising a body of generally fan-shaped configuration having two opposed faces which have grooves formed therein for filtrate drainage, said body further having two radially extending sides, each side having a concave channel formed therein along which a radial rod securing said body to a supporting shaft extends and formed within said channel a concave slot along which a sector rod securing said body to a bell member extends; said channel and slot on each radial side of said body being formed to extend lengthwise along said sides.

4,159,952

POWDERED HYDRATED EMULSIFIERS AND THEIR METHOD OF PREPARATION

Clifford A. Jackson, Sanford, Fla., assignor to Southland Corporation, Dallas, Tex.

Filed Dec. 21, 1977, Ser. No. 862,908
Int. Cl.[2] B01F *17/34*
U.S. Cl. 252—356 **10 Claims**

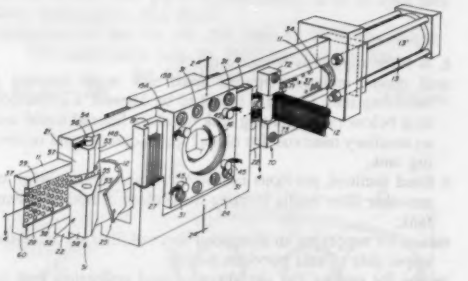
1. A method for the preparation of powdered hydrated emulsifiers, said method comprising the steps of:
a. selecting said emulsifier from the group consisting of fatty acid partial esters of polyhydric alcohols, half esters of succinic acid of a mono-acylated polyalcohol, alkoxylated condensates of monoglycerides, stearoyl 2 lactylate and calcium and sodium salts thereof, alkoxylated fatty acid partial esters of polyhydric alcohols, diacetyl tartaric acid esters of fatty acid partial esters of polyhydric alcohols, and mixtures of said emulsifiers;
b. heating the emulsifier until melted;
c. pumping said heated emulsifier through a conduit;
d. injecting water at a temperature above 100° F. into the stream of said heated emulsifier; and
e. spraying the water-emulsifier mixture through a spray nozzle into a cooling chamber to obtain said powdered hydrated emulsifiers containing 2–15% by weight water of hydration.

4,159,953

SLIDE PLATE FILTERS FOR THERMOPLASTIC AND SIMILAR MATERIALS

James P. Paquette, Uxbridge, Mass., assignor to The Berlyn Corporation, Worcester, Mass.

Filed Jun. 5, 1978, Ser. No. 912,538
Int. Cl.[2] B01D *35/16*
U.S. Cl. 210—396 **14 Claims**



1. In slide filter apparatus for filtering contaminants from a fluid working material flowing in a defined path, the working material having the property that it can stiffen in response to temperature change, the apparatus having rigid self-supporting filter plate means for carrying on an up-stream surface replaceable filter media means from an inlet port passageway across the path of fluid flow to an outlet port passageway, the cross section of the outlet port passageway being larger than the cross section of the filter plate means so as to form a gap into which fluid working material can escape from said path, and temperature control means to form a seal of stiffened working

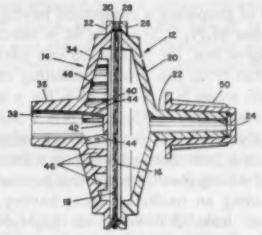
material binding said filter media means to said filter plate means in the gap, the improvement comprising means to brake and strip said filter plate means provided at a predetermined positioning outside the exit end of said outlet port passageway for separating said filter media means together with the stiffened working material and contaminants collected therein from said upstream surface of the filter plate means exiting from said outlet port passageway, and means at said inlet port passageway to force said filter plate means into said inlet port passageway and through said passageways against said stripper means, said predetermined positioning providing a filter plate means sufficiently clean so that it can be reused without requiring treatment to remove spent filter media and collected contaminants from it after said filter plate means is passed by said means to brake and strip said filter plate means.

4,159,954

ISOLATOR FILTER

Ronald J. Gangemi, 15598 Producer La., Huntington Beach, Calif. 92649

Filed Feb. 24, 1978, Ser. No. 880,802
Int. Cl.[2] B01D *25/04*
U.S. Cl. 210—446 **8 Claims**



1. In a filter device, the combination comprising:
first and second generally funnel-shaped housings, each of said housings having a generally conical portion and a spout portion with an aperture extending therethrough, the outer peripheries of said first and second housings being generally identically configured;
a microporous film membrane having a dimension generally equal to the dimension of said periphery;
porous support means configured for abuttingly engaging said membrane;
means securing the peripheries of said first and second housings together with said membrane and said support means interposed therebetween;
a generally cup-shaped deflector member secured to the interior of the conical portion of one of said housings with the bottom of said deflector member in general alignment with the aperture of the spout portion of said housing, said deflector member having a plurality of radially outwardly disposed openings for passage of fluid therethrough; and
rib means on the inner surface of the conical portion of said housing in radial relation to said openings, said deflector member and said rib means dispersing fluid injected into said housing generally radially for uniformly dispersing such fluid over the surface of said support means.

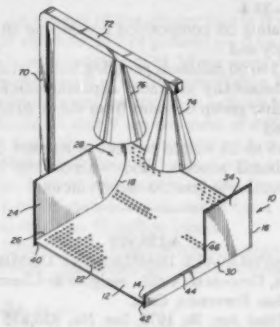
4,159,955

FOOD DISPENSING BIN

David Asmus, Jr., Rte. 1, Box 582, Laramie, Wyo. 82070

Filed Nov. 9, 1977, Ser. No. 849,758
Int. Cl.[2] B01D *23/02*
U.S. Cl. 210—473 **7 Claims**

1. A food dispensing bin comprising:
a perforated bottom wall extending from the front of said bin horizontally toward near the rear of said bin and then smoothly curving upward and reentrantly as to captivate food segments urged toward the rear of said bin, the perforations in said bottom wall being of a size to permit drainage of liquid from said segments carried on said bottom wall;
a first upright side wall extending from the front to the rear of said bin along one side margin of said bottom wall and



having a height sufficient to form a closure of the reentrant portion of said bottom wall;
and a second upright side wall extending from the front to the rear of said bin along the other side margin of said bottom wall and having a height sufficient to form a closure of the reentrant portion of said bottom wall.

4,159,956

SUCCINIMIDE DISPERSANT COMBINATION

Louis de Vries, Greenbrae, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1978, Ser. No. 920,876
Int. Cl.[2] C10M *1/32, 3/26, 5/20, 7/30*
U.S. Cl. 252—33.4 **8 Claims**

1. A lubricating oil composition comprising an oil of lubricating viscosity and
(A) from 2.5 to 50 millimols per kilogram of an alkaline earth metal substantially saturated aliphatic sulfonate wherein the aliphatic group contains from about 20 to 300 carbon atoms, and
(B) from 0.5 to 20 weight percent of an alkenyl mono-succinimide wherein the alkenyl group contains about 50 to 300 carbon atoms.

4,159,957

MANNICH BASE DISPERSANT COMBINATION

Louis de Vries, Greenbrae, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1978, Ser. No. 920,873
Int. Cl.[2] C10M *1/32, 3/26, 5/20, 7/30*
U.S. Cl. 252—33.4 **8 Claims**

1. A lubricating oil composition comprising an oil of lubricating viscosity and
(A) from 2.5 to 50 millimols per kilogram of an alkaline earth metal substantially saturated aliphatic sulfonate wherein the aliphatic group contains from about 50 to 300 carbon atoms, and
(B) from 0.5 to 20 weight percent of a high-molecular-weight Mannich base or a borated complex thereof.

4,159,958

SUCCINATE DISPERSANT COMBINATION

Louis de Vries, Greenbrae, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1978, Ser. No. 920,874
Int. Cl.[2] C10M *1/32, 3/26, 5/20, 7/30*
U.S. Cl. 252—33.4 8 Claims

1. A lubricating oil composition comprising an oil of lubricating viscosity and

(A) from 2.5 to 50 millimols per kilogram of an alkaline earth metal substantially saturated aliphatic sulfonate wherein the aliphatic group contains from about 20 to 300 carbon atoms, and

(B) from 0.5 to 20 weight percent of an ester of hydrocarbonsubstituted succinic acid wherein the hydrocarbon group contains at least 50 carbon atoms.

4,159,959

THIOPHOSPHONATE DISPERSANT COMBINATION

Louis de Vries, Greenbrae, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1978, Ser. No. 920,875
Int. Cl.[2] C10M *1/32, 3/26, 5/20, 7/30*
U.S. Cl. 252—33.4 6 Claims

1. A lubricating oil composition comprising an oil of lubricating viscosity and

(A) from 2.5 to 50 millimols per kilogram of an alkaline earth metal substantially saturated aliphatic sulfonate wherein the aliphatic group contains from about 20 to 300 carbon atoms, and

(B) from 0.5 to 20 weight percent of a mono-hydroxyalkyl hydrocarbyl thiophosphonate.

4,159,960

LUBRICANT COMPOSITIONS

Gerassimos Frangatos, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 2, 1977, Ser. No. 793,014
Int. Cl.[2] C10M *1/10*
U.S. Cl. 252—49.9 8 Claims

1. A lubricant composition comprising a mineral oil, synthetic oil or greases thereof and an antiwear amount of a product prepared by reacting from about 1 mole to about 2 moles of a methallyl halide and from about 1 to about 2 moles of a halogen with one mole of a trialkyl phosphate containing 1 to 6 carbon atoms, the reaction being carried out at from about −5° C. to about 80° C., the product containing from about 5% to about 24% of halide and from about 4% to about 10% of phosphorus, all by weight.

4,159,961

DIELECTRIC AND NON-MAGNETIC CERAMIC FOR HIGH FREQUENCY APPLICATIONS

Roland Sroussi; Jean Nicolas, and Jacques Claudon, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 4, 1976, Ser. No. 738,842
Claims priority, application France, Nov. 7, 1975, 75 34161
Int. Cl.[2] H01B *3/00*
U.S. Cl. 252—63.2 11 Claims

1. A dielectric and non-magnetic ceramic suitable for high frequency applications, which comprises:

a polycrystalline ferrite of the formula:

$$Y_{3-x-z}Ca_{x+z}Zr_xFe_{5-x-y-z}Al_yMe_zO_{12}$$

wherein Me is Ge, Si or Ti, $O \leqq y \leqq 2$, $O \leqq z \leqq 1$ and x is 2, wherein Fe^{+3} ions present in the octahedral sites of the parent ferrite are replaced by non-magnetic ions.

8. A dielectric and non-magnetic ceramic suitable for high frequency applications, which comprises:

a polycrystalline ferrite of the spinel type of the formula:

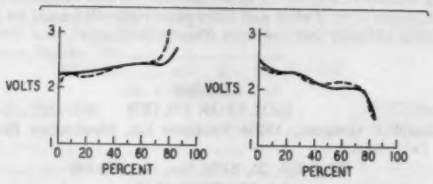
$$(1+y)Li_2O.2xZnO.(2x+4y)TiO_2.$$

4,159,962

METHOD OF PREPARING LAYERED CHALCOGENIDES

Francis J. Di Salvo, Jr., Florham Park, and Donald W. Murphy, Warren, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 810,176, Jun. 27, 1977, Pat. No. 4,125,687.
This application May 30, 1978, Ser. No. 910,193
Int. Cl.[2] H01M *4/88*
U.S. Cl. 252—182.1 7 Claims



1. A method of preparing a compound having the nominal atom composition $M_xN_{1-x}S_2$ where M is selected from the group consisting of Mn, Fe, Ni and Co and mixtures thereof, and N is selected from the group consisting of V, Cr, and mixtures thereof; when N is V and M is Fe, x is less than or equal to a maximum value of 0.5; when N is V and M is Mn, Ni or Co, x is less than or equal to a maximum value of 0.33; and when N is Cr, x is less than a maximum value of 0.33, said maximum value scaling linearly with atom percent, comprising the steps of adding an oxidizing agent having an oxidizing potential of at least 2.8 volts to $Li_yM_xN_{1-x}S_2$, said $Li_yM_xN_{1-x}S_2$ being prepared by reacting stoichiometric quantities of the alkali metal carbonate, an oxide of M, and an oxide of N with sulfur, where y is less than or equal to one.

4,159,963

CATALYST FOR PRODUCING POLYOLEFINS

Hisaya Sakurai; Hideo Morita; Tadashi Ikegami, and Masayoshi Miya, all of Kurashikishi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 30, 1978, Ser. No. 873,630
Claims priority, application Japan, Feb. 16, 1977, 52-14940
Int. Cl.[2] C08F *4/64*
U.S. Cl. 252—429 B 15 Claims

1. In a catalyst useful for polymerizing olefins comprising a magnesium compound, a titanium compound, an electron donor, and an organometallic compound, the improvement which is characterized in that a solid (1) is obtained by reacting one mole of organomagnesium component (i) represented by the general formula

$$M_\alpha Mg_\beta R_p^1 R_q^2 X_r Y_s$$

wherein

α is a number of 0 or greater than 0;

$\beta > 0$;

p, q, r and s are each numbers 0 or greater than 0, respectively, having the relationship of $p+q+r+s=m\alpha+2\beta$;

M is a metal component of the 1st to the 3rd group of the Periodic Table;

m is the valency of M;

R^1 and R^2 are the same or different hydrocarbon groups having 1–20 carbon atoms;

X and Y are the same or different groups selected from the group consisting of halogen, OR^3, $OSiR^4R^5R^6$, NR^7R^8 and SR^9,

wherein

R^3, R^4, R^5, R^6, R^7 and R^8 are hydrogen atoms or hydrocarbon groups having 1–20 carbon atoms, and

R^9 is a hydrocarbon group having 1–20 carbon atoms, with 0.01–100 moles of chlorosilane compound (ii) containing Si—H bonds and represented by the general formula

$$H_aSiCl_bR_{4-(a+b)}$$

wherein

$0<a\leqq 2$,

b is a number greater than 0,

$a+b\leqq 4$, and

R is a hydrocarbon group having 1–20 carbon atoms, that a solid catalyst component (A) is obtained by reacting said solid (1), a titanium compound (2) selected from a tetravalent titanium halide and/or a trivalent titanium halide, and a carboxylic acid or a derivative thereof (3) selected from a carboxylic acid having up to 30 carbon atoms, an acid halide having up to 30 carbon atoms, an acid anhydride or a carboxylic acid ester having up to 30 carbon atoms in the carboxylic portion, and that said catalyst component (A) is used with a component (B) comprising an organometallic compound of a metal selected from Groups I, II, III of the Periodic Table mixed with a carboxylic acid or derivative thereof selected from a carboxylic acid having up to 30 carbon atoms, an acid halide having up to 30 carbon atoms, an acid anhydride or a carboxylic acid ester having up to 30 carbon atoms in the carboxylic portion.

4,159,964

METAL CHELATE CATALYST AND ALKANOLAMINE HYDROXIDE ON ADSORPTIVE SUPPORT

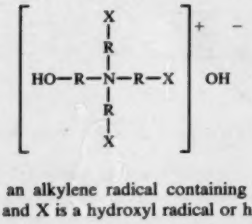
Robert R. Frame, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 868,600, Jan. 11, 1978, Pat. No. 4,124,494. This application Jul. 28, 1978, Ser. No. 928,925

Int. Cl.[2] B01J *31/12, 31/02*

U.S. Cl. 252—428 **12 Claims**

1. A catalytic composite comprising a metal chelate mercaptan oxidation catalyst and an alkanolamine hydroxide impregnated on a solid adsorptive support, said alkanolamine hydroxide being represented by the structural formula



wherein R is an alkylene radical containing up to about 3 carbon atoms and X is a hydroxyl radical or hydrogen.

4,159,965

CATALYST USEFUL FOR POLYMERIZING OLEFINS

Hisaya Sakurai; Hideo Morita; Tadashi Ikegami, and Shigeo Tsuyama, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 26, 1977, Ser. No. 836,343

Claims priority, application Japan, Sep. 28, 1976, 51-115400; Dec. 6, 1976, 51-145695

Int. Cl.[2] C08F *4/64, 4/68*

U.S. Cl. 252—429 B **16 Claims**

1. In a catalyst useful for polymerizing olefins comprising a solid catalyst component (A) obtained from a magnesium compound plus a titanium or vanadium compound, and an organometallic compound (B) of a metal selected from Groups I, II, III of the Periodic Table,

the improvement which comprises forming said solid catalyst component (A) by reacting

one mole of an organomagnesium component (i) represented by the general formula

$$M_\alpha Mg_\beta R_p^1 R_q^2 X_r Y_s$$

wherein α is a number of 0 or greater than 0; $\beta>0$; p, q, r and s are each a number of 0 or greater; $p+q+r+s=m\alpha+2\beta$ wherein m is the valency of M; M is a metal element of the 1st to the 3rd group of the Periodic Table; R^1 and R^2 are the same or different hydrocarbon radicals having 1 to 20 carbon atoms; X and Y are the same or different radicals selected from the group consisting of halogen, OR^3, $OSiR^4R^5R^6$, NR^7R^8 and SR^9 wherein R^3, R^4, R^5, R^6, R^7 and R^8 are each hydrogen atom or a hydrocarbon radical having 1 to 20 carbon atoms and R^9 is a hydrocarbon radical having 1 to 20 carbon atoms,

with 0.01–100 moles of a chlorosilane compound (ii) containing Si-H bond and having the general formula

$$H_aSiCl_bR_{4-(a+b)}$$

wherein a and b are each a number greater than 0, having the relationships $a\leqq 2$ and $a+b\leqq 4$ wherein R is a hydrocarbon radical having 1 to 20 carbon atoms

to form a solid (1),

and reacting and/or contacting by grinding, said solid (1) with a titanium and/or vanadium halide or alkoxyhalide.

4,159,966

CHROMATOGRAPHIC COLUMN PACKING

Charles B. Roberts, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1977, Ser. No. 864,414

Int. Cl.[2] B01J *31/02;* **B01D** *15/08*

U.S. Cl. 252—430 **8 Claims**

1. A chromatographic column packing comprising a chemically bond chromatographic partitioning agent selected from the group consisting of aliphatic alcohols, aliphatic polyols, polyglycol ethers, polyglycol amines, polyamines, aliphatic and aromatic amides thio-compounds and alkoxy amides, having molecular weights of from about 200 to 20,000, and sugars bonded through O, S or N to a Group III metal atom which is bound to a silica and/or alumina support through oxygen said group III metal having been incorporated into the structure as a metal hydride and having any hydrogen atoms not replaced by said partitioning agent replaced with a low molecular weight, below 200, alcohol.

8. A method for preparing bonded chromatographic column packings comprising reacting by contacting an active hydrogen containing silica, alumina or silica-alumina solid support which has been modified by reaction with a Group III metal hydride selected from the group consisting of aluminum, boron, gallium or indium then reacted with a chromatographic partitioning agent selected from the group consisting of aliphatic alcohols, aliphatic polyols, polyglycol ethers, polyglycol amines, polyamines, aliphatic and aromatic amides and alkoxy amides, having molecular weights of from about 200 to 20,000, and sugars neat or in the presence of an inert solvent at from about room temperature to about 100° C. until the evolution of hydrogen is ceased, said partitioning agent being employed in amounts to react with from a few to all of the activated sites on said activated support, and reacting any unreacted hydrogen atom sites of said Group III metal hydride with a low molecular weight, below 200, compound of the class afore set forth.

4,159,967

CATALYST FOR THE OXIDATION OF A CONJUGATED DIOLEFIN

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 721,645, Sep. 8, 1976, Pat. No. 4,095,037. This application Mar. 3, 1978, Ser. No. 883,014

Int. Cl.[2] B01J *23/04, 27/08, 27/24, 31/12*

U.S. Cl. 252—438 6 Claims

1. A composition consisting essentially of a bismuth compound, an alkali metal compound and a source of nitrate ion wherein the bismuth compound is selected from the group consisting of oxides, nitrates, halides and mixtures thereof, the alkali metal compound is selected from the group consisting of halide, carboxylate, oxide, nitrate and mixtures thereof, and the source of nitrate ion is provided by an inorganic compound in which the cationic portion of the compound is essentially inert under oxidizing conditions when said cationic portion is other than bismuth or an alkali metal.

4,159,968

CATALYST FOR THE PREPARATION OF ETHYLENE AND VINYL CHLORIDE FROM ETHANE

William J. Kroenke, Brecksville; Richard T. Carroll, Cuyahoga Falls, and Angelo J. Magistro, Brecksville, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 669,896, Mar. 24, 1976, Pat. No. 4,102,935. This application Mar. 16, 1978, Ser. No. 887,152

Int. Cl.[2] B01J *21/04, 23/10, 23/74*

U.S. Cl. 252—462 8 Claims

1. A solid solution catalyst consisting essentially of iron cations substituted for aluminum cations in a host lattice of α-Al_2O_3 and having an iron content of from about 0.1 percent to about 20 percent by weight expressed as the oxide; stabilized with a total lanthanide content of from about 0.1 percent to 20 percent by weight expressed as the oxide; and having an X-ray diffraction pattern having peak positions different than that of the host lattice, all weight percents based upon the weight of the catalyst.

4,159,969

PROCESS FOR THE PREPARATION OF AGGLOMERATES OF POROUS ALUMINUM OXIDE

Rudolf A. J. Moné, Avenhorn, and Gijsbertus Klaver, Ilpendam, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jan. 20, 1978, Ser. No. 871,049

Claims priority, application Netherlands, Nov. 30, 1977, 7700810

Int. Cl.[2] B01J *21/04*

U.S. Cl. 252—463 5 Claims

1. A process for the preparation of agglomerates of aluminum oxide comprising contacting a hydrous aluminum oxide gel with an organic liquid which is essentially immiscible with water, the amount of liquid utilized being such that the weight ratio of said liquid to water, as contained in the gel, lies within a portion of a curve which plots said ratio versus the pore volume of aluminum oxide obtained after being dried and calcined, expressed in terms of milliliters per gram, which portion has a slope equal to or greater than about 4.0, and agglomerating the gel subsequent to being contacted with the organic liquid.

4,159,970

ALKALINE EARTH OXIDES PROMOTED WITH MANGANESE OXIDE AND/OR RHENIUM OXIDE AS CATALYSTS FOR CRACKING AND DEHYDROCYCLIZING OF ALKANES

Louis F. Heckelsberg, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartesville, Okla.

Division of Ser. No. 580,010, May 22, 1975, Pat. No. 4,093,536, which is a continuation-in-part of Ser. No. 460,935, Apr. 15, 1974, abandoned. This application Mar. 3, 1978, Ser. No. 883,017

Int. Cl.[2] B01J *23/02, 23/34, 23/36*

U.S. Cl. 252—471 11 Claims

1. A composition of matter consisting essentially of components selected from the group consisting of:

A. two alkaline earth metal oxides wherein the alkaline earth metal is selected from the group consisting of magnesium, calcium, strontium and barium and a promoting amount of a mixture of manganese oxide and rhenium oxide

B. at least one alkaline earth metal oxide wherein the alkaline earth metal is selected from the group consisting of magnesium, calcium, strontium and barium and a promoting amount of rhenium oxide

C. an alkaline earth metal oxide wherein the alkaline earth metal is selected from the group consisting of strontium and barium, and a promoting amount of a mixture of manganese oxide and rhenium oxide.

4,159,971

OZONE GENERATOR

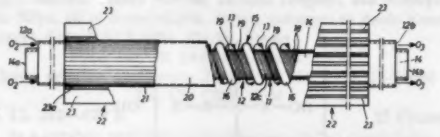
Arthur Gneupel, Bitziberg 5, Bachenbulach, Switzerland

Filed Jan. 31, 1977, Ser. No. 764,219

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606731; Aug. 2, 1976, 2634720

Int. Cl.[2] C01B *13/11*

U.S. Cl. 250—540 26 Claims



1. A substantially tubular-shaped ozone generator comprising:

an inner electrode of substantially hollow cylindrical configuration, said inner electrode consisting of a metallic grid,

an outer electrode coaxially arranged to and surrounding said inner electrode,

a tubular member formed of dielectric material arranged between said inner electrode and said outer electrode, said tubular member being in contact with said outer electrode,

a substantially cylindrical core arranged within said inner electrode and surrounded by said inner electrode, and

helix means extending around said core throughout the length of said core, said helix means also extending from the outer surface of said core and pressing said inner electrode against said tubular member, said helix means defining at least one substantially helically-shaped groove extending substantially in the axial direction of said core, and said at least one groove providing the only through-pass channel for a medium to be ozonized and the ozone which is formed.

4,159,972

DISSOLUTION OF POLYURETHANE FOAMS AND RE-USE OF THE PRODUCTS THEREFROM

Jacob Braslaw, and Purnachandra Pai, both of Southfield, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 17, 1977, Ser. No. 842,865
Int. Cl.[2] C08J 9/38
U.S. Cl. 260—2.3 5 Claims

1. In a method for recovery of flexible urethane foam made from reacting a mixture comprising polyisocyanate and polyol having a number average weight exceeding about 1000, wherein the foam is liquified at elevated temperatures in the presence of aliphatic diol of the formula HO-A-OH wherein A is oxy interrupted alkylene and up to 6 carbons, an improvement that permits recovery of products suitable for use in preparing new flexible foam, which comprises:

(a) dissolving the foam in the presence of the diol at a temperature in a range up to 210° C. for a time sufficient to form a single or subtantially single liquid layer;

(b) admixing after the dissolution of (a), liquid polyol (B) having a number average molecular weight of about 1000–10,000, that is suitable for use in preparation of flexible foam;

(c) removing under vacuum at least about 70% by weight of the diol from the liquid admixture of (b) at a temperature in a range exceeding about 100° C.; and

(d) collecting the liquid polyol residue from the distilled admixture.

4,159,973

STABILIZER SYSTEMS AND VINYL HALIDE RESIN COMPOSITIONS CONTAINING SAME

Samuel Hoch, Brooklyn, N.Y.; Robert E. Lally, Englishtown, N.J., and Mario Q. Ceprini, Cedarhurst, N.Y., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Mar. 6, 1978, Ser. No. 883,964
Int. Cl.[2] C08F 14/06; C08K 5/50; C08L 27/06
U.S. Cl. 260—23 XA 30 Claims

1. A stabilizer system for vinyl halide resin compositions that comprises

(a) a liquid, oil-soluble, epoxidized-vegetable oil-compatible overbased barium salt complex that is the product obtained by

(i) forming a reaction mixture that consists essentially of

(a) a basic barium compound,

(b) an alkylphenol having from 1 to 3 alkyl groups, each of which has from 8 to 12 carbon atoms, and

(c) an inert liquid organic diluent,

in the amounts of at least 0.75 mole of said alkylphenol per mole of said barium compound and 10% to 50% by weight of said diluent, based on the weight of the reaction mixture, and

(ii) maintaining said reaction mixture at a temperature of at least 180° C. while treating it with carbon dioxide to reduce its basicity;

(b) at least one polyvalent metal salt selected from the group consisting of cadmium, zinc, zirconium, tin, and calcium salts of benzoic acid, alkylbenzoic acids, halobenzoic acids, hydroxybenzoic acids, and alkanoic acids having 2 to 22 carbon atoms;

(c) at least one organic phosphite selected from the group consisting of secondary and tertiary aryl, alkyl, and alkyl aryl phosphites in which the alkyl groups have from 3 to 18 carbon atoms and the aryl groups are phenyl, alkylphenyl, halophenyl, or hydroxyphenyl; and

(d) an aromatic or aliphatic hydrocarbon solvent,

in the amounts of 0.1 part to 5 parts by weight of the polyvalent metal salt component, 0.1 part to 5 parts by weight of the organic phosphite component, and 0.1 part to 5 parts by weight of the hydrocarbon solvent per part by weight of the overbased barium salt complex.

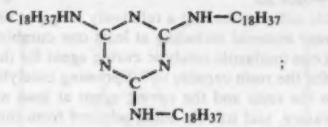
4,159,974

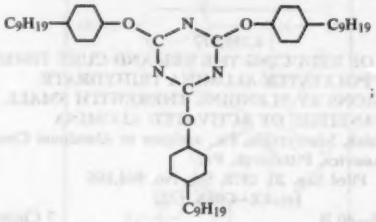
PLASTICIZED POLYCARBONATE COMPOSITION

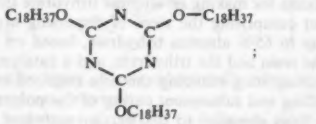
Victor Mark, Evansville, and Phillip S. Wilson, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

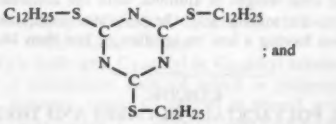
Filed Jun. 29, 1977, Ser. No. 811,068
Int. Cl.[2] C08K 5/34
U.S. Cl. 260—30.2 4 Claims

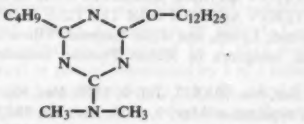
1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of an organic plasticizer selected from the group having the following formulae:


(a)


(b)


(c)


(d)


(e)

4,159,975

POLYETHER LUBRICANTS FOR USE IN THE PROCESSING OF PLASTICS

Heinz Praetorius; Karl Seibert, both of Duren, and Werner Holtvoigt, Lonne-Riessel, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Dec. 14, 1977, Ser. No. 860,508
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1976, 2656927
Int. Cl.[2] C08L 27/06, 27/08
U.S. Cl. 525—91 7 Claims

1. A composition comprising a thermoplastic polymer and from about 0.05 to about 2.0 percent, based on the weight of the polymer, of a polyalkylene oxide lubricant made from a monomer selected from the group consisting of aliphatic, non-substituted 1,2-alkylene oxides containing from about 6 to about 40 carbon atoms, and mixtures thereof, said polyalkylene

oxides having an average molecular weight from 1,000 to about 6,000.

4,159,976

CURABLE SYSTEMS CONTAINING EPOXY RESIN AND METHANOL OR ETHANOL SOLVENT TO SUPPRESS THE CATALYTIC REACTION BETWEEN EPOXY RESIN AND AN IMIDAZOLE CATALYTIC CURING AGENT

James P. Moran, Jr., Waterbury, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed Mar. 10, 1977, Ser. No. 776,142
Int. Cl.[2] C08G *59/00, 59/18;* C08L *63/02, 63/00*
U.S. Cl. 260—33.4 EP 6 Claims

1. A curable adhesive having a relatively long pot life comprising polymer material including at least one curable epoxy resin, at least one imidazole catalytic curing agent for the resin, and solvent for the resin capable of suppressing catalytic reaction between the resin and the curing agent at least at about room temperature, said solvent being selected from the group consisting of methanol, ethanol and mixtures thereof.

4,159,977

METHOD OF REDUCING THE GEL AND CURE TIMES FOR POLYESTER-ALUMINA TRIHYDRATE DISPERSIONS BY BLENDING THEREWITH SMALL QUANTITIES OF ACTIVATED ALUMINA

Hsiun P. Hsieh, Murrysville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 20, 1978, Ser. No. 944,186
Int. Cl.[2] C08K *3/22*
U.S. Cl. 260—40 R 7 Claims

1. In a process for making an alumina trihydrate filled polyester product comprising the steps of dispersing a polyester resin with up to 65% alumina trihydrate, based on the total weight of the resin and the trihydrate, and a catalyst, the improvement comprising reducing the time required to accomplish the gelling and subsequent curing of the polyester resin by blending from about 2.0 to 10.0 percent activated alumina, based on the total weight of alumina, with the alumina trihydrate prior to the mixing with the polyester resin, said activated alumina having a loss on ignition of less than 10.0 percent.

4,159,978

NOVEL POLYACETAL POLYMERS AND THEIR APPLICATION AS SOIL RELEASE AND ANTI-SOIL REDEPOSITION AGENTS FOR TEXTILE SUBSTRATES

Robert Violland, Lyons, and Alain Lagasse, Villeurbanne, both of France, assignors to Rhone Poulenc Industries, Paris, France

Division of Ser. No. 703,827, Jul. 9, 1976, Pat. No. 4,107,056.
This application Mar. 9, 1978, Ser. No. 884,827
Claims priority, application France, Jul. 10, 1975, 75 22626
Int. Cl.[2] C08G *12/04*
U.S. Cl. 525—441 9 Claims

1. A hydrophilic polyacetal polymer prepared by reacting Reactant composition I comprising:

(A) 20–60 percent of a reaction product

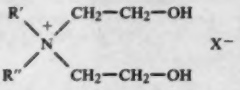
(A) of a phthalic acid, phthalic anhydride of a phthalic diester and at least one saturated diol having a molecular weight less than 300, said reaction product having a hydroxyl number of between 150 and 500 and an acid number of less than 2.

(B) 40–80 percent of a component (B) comprising.

1. A mixture comprising:

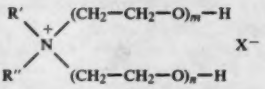
(a) 50 to 100 weight percent of a hydroxylated compound represented by the general formula R—$(OC_xH_{2x})_n$—OH wherein R represents a hydrogen or a hydrocarbyl radical selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, and aralkyl containing 1 to 20 carbon atoms, x is 2, 3, or 4 and n is an integer such that molecular weight ranges from between 300 and 10,000

(b) 0–50 weight percent of a quaternary dialkyl diethanolamine represented by the general formula:



wherein R′ and R″ represents the same or different alkyl groups containing less than 5 carbon atoms or a benzyl radical − and X^- is a halogen or methylsulfate ion, or

2. 100 weight percent of a quaternary ammonium compound containing both oxyalkylene units and quaternized nitrogen atoms represented by the general formula:



wherein R′ and R″ represent the same or different members selected from alkyl radicals containing less than 5 carbon atoms or benzyl radicals, and m and n are numbers the sum of which is less than 15 and X^- is a halide or methylsulfate ion. With Reactant Composition II comprising an aldehyde is represented by the general formula:

wherein R_1 represents a hydrogen atom, an alkyl, an aryl or an alkenyl group containing 1 to 10 carbon atoms; wherein the number of mols of aldehyde is at least equal to half the total number of hydroxyl groups contained in Reactant Composition I.

4,159,979

PROTECTED AMINO ACIDS OR PEPTIDES

Masahiko Fujino, Takarazuka; Tsunehiko Fukuda, Minoo, and Chieko Kitada, Sakai, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 18, 1978, Ser. No. 897,640
Claims priority, application Japan, Apr. 22, 1977, 52/47030
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 R 18 Claims

1. An amino acid selected from the group of lysin,e α,β-diaminopropionic acid, α,γ-diaminobutyric acid and ornithine having a protective group or a peptide containing the residue of such a protected amino acid, where the protective group is p-methylbenzylsulfonyl.

4,159,980

PROCESS FOR PREPARING THE RELEASING HORMONE OF LUTEINIZING HORMONE (LH) AND OF FOLLICLE STIMULATING HORMONE (FSH), SALTS AND COMPOSITIONS THEREOF, AND INTERMEDIATES THEREFOR

Hans U. Immer; Verner R. Nelson, both of Montreal, and Manfred K. Gotz, Hudson, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 226,508, Feb. 15, 1972, Pat. No. 3,835,108.
This application Mar. 29, 1974, Ser. No. 456,343
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 LH 1 Claim

1. N-[N-(N-Carboxy-N^G-nitro-L-arginyl)-L-prolyl]-glycinamide N-t-butyl ester.

4,159,981

PEPTIDES AND PROCESS FOR THEIR MANUFACTURE

Werner Rittel, Basel; Max Brugger, Birsfelden; Bruno Kamber, Basel; Bernhard Riniker, Frenkendorf; Peter Sieber, Reinach, all of Switzerland, and Hendrik M. Greven, Heesch, Netherlands, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

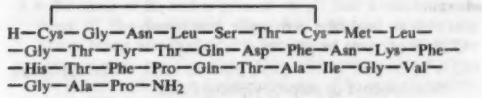
Continuation of Ser. No. 641,480, Dec. 17, 1975, abandoned, which is a continuation of Ser. No. 271,873, Jul. 14, 1972, Pat. No. 3,934,008, which is a continuation of Ser. No. 850,254, Aug. 14, 1969, abandoned. This application Oct. 4, 1977, Ser. No. 842,122

Claims priority, application Switzerland, Aug. 23, 1968, 12691/68; Aug. 27, 1968, 12811/68; Aug. 30, 1968, 13067/68; Oct. 10, 1968, 15147/68; Nov. 19, 1968, 17235/68

Int. Cl.[2] C07C *103/52*

U.S. Cl. 260—112.5 T 6 Claims

1. A process for the manufacture of a compound of the formula



H—Cys—Gly—Asn—Leu—Ser—Thr—Cys—Met—Leu—
—Gly—Thr—Tyr—Thr—Gln—Asp—Phe—Asn—Lys—Phe—
—His—Thr—Phe—Pro—Gln—Thr—Ala—Ile—Gly—Val—
—Gly—Ala—Pro—NH_2

and corresponding compounds in which one or more of the asparagine and glutamine residues are replaced by the aspartic acid or glutamic acid residue, respectively, or the aspartic acid residue is exchanged for the asparagine residue, wherein a compound corresponding to any of these compounds in which compound both amino groups of Cys in 1-position and of Lys in 18-position are protectedby a member selected from the group consisting of an aliphatic or cycloaliphatic oxycarbonyl group used as amino protecting group in peptide syntheses, an aralkyl group used as amino protecting group in peptide syntheses, an arylmethoxycarbonyl group used in peptide syntheses which is unsubstituted in the aryl moiety or is substituted by lower alkyl or alkoxy groups or halogen atoms in the aryl moiety, and derivatives of these substituents which are substituted by lower alkyl groups on the methylene group of said arylmethoxy carbonyl group, and one or more of the carboxyl groups present are protected by a carboxyl protecting group used in peptide syntheses and selected from the group consisting of a lower tertiary alkyl ester group and an aryl lower alkyl ester group, and in which compound any hydroxyl groups are free or are protected by a hydroxy protecting group used in peptide syntheses and selected from the group consisting of tetrahydropyranyl ether groups, tertiary lower alkyl ether groups and the 2,2,2-trifluoro-1-tert. butyloxycarbonylaminoethyl group, and the histidine imino group is free or is protected by the trityl or the adamantyloxycarbonyl group, the protective groups are split off.

4,159,982

PROTEIN/STARCH COMPLEX

Anne-Marie I. Hermansson, S-416 60 Göteborg, Sweden

Filed Apr. 4, 1978, Ser. No. 893,412

Int. Cl.[2] A23J *1/20*

U.S. Cl. 260—119 20 Claims

1. A protein/starch complex having (a) protein in the form of casein or caseinate and (b) a protein/starch weight ratio of from 1:20 to 3:2.

4,159,983

PURE AND SUBSTANTIALLY PURE ASYMMETRIC 1:2 COBALT COMPLEXES OF MONOAZO COMPOUNDS

Jacky Dore, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

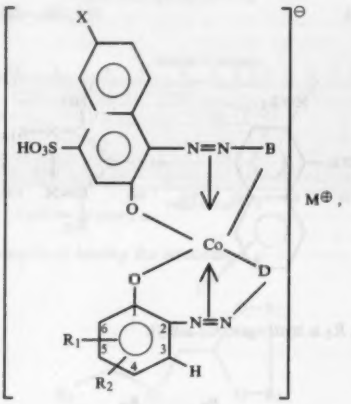
Continuation-in-part of Ser. No. 707,140, Jul. 20, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 869,480

Claims priority, application Switzerland, Jun. 14, 1977, 7292/77; Dec. 12, 1977, 15216/77; Jul. 25, 1975, 9738/78

Int. Cl.[2] C09B *45/20, 45/48*

U.S. Cl. 260—145 A 29 Claims

1. A complex of the formula



said complex being at least substantially pure, or a mixture of such complexes, wherein

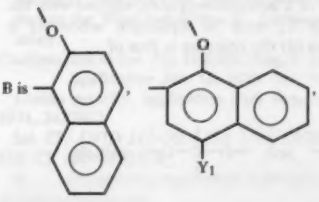
R_1 is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, chloro, bromo or nitro,

R_2 is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, chloro, bromo, nitro or $—SO_2NR_3R_4$, wherein

R_3 is hydrogen, C_{1-4}alkyl or C_{1-4}alkyl substituted by 1 or 2 substituents each of which is independently halo, hydroxy, cyano, C_{1-4}alkoxy or phenyl, and

R_4 is hydrogen; C_{1-4}alkyl; C_{1-4}alkyl substituted by 1 or 2 substituents each of which is independently halo, hydroxy, cyano, C_{1-4}alkoxy or phenyl; C_{5-7}cycloalkyl; C_{5-7}cycloalkyl substituted by 1 to 3 methyl groups; phenyl or phenyl substituted by 1 to 3 substituents each of which is independently halo, C_{1-4}alkyl, C_{1-4}alkoxy or nitro, with the proviso that the maximum number of nitro substituents is 2, or

R_3 and R_4 taken together and with the nitrogen atom to which they are joined are pyrrolidino, piperidino or morpholino, with the proviso that when R_2 is $—SO_2NR_3R_4$, R_1 must be hydrogen, chloro or nitro and one of R_1 and R_2 must be in the 4-position and the other must be in the 5-position,



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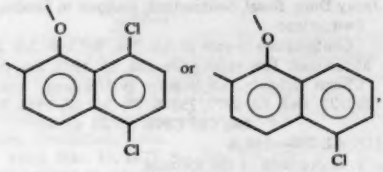
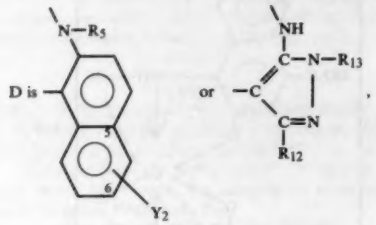
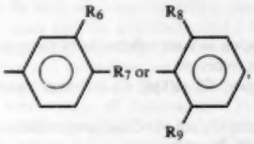


wherein Y_1 is hydrogen, C_{1-2}alkyl, C_{1-2}alkoxy, chloro or bromo,



wherein R_5 is hydrogen, C_{1-4}alkyl,



wherein one of R_6 and R_7 is hydrogen and the other is hydrogen, chloro, bromo, C_{1-2}alkyl, C_{1-2}alkoxy or trifluoromethyl,

R_8 is hydrogen or methyl, and

R_9 is methyl, chloro or bromo, with the proviso that R_8 must be hydrogen when R_9 is chloro or bromo,

R_{12} is hydrogen, C_{1-4}alkyl, C_{1-2}alkoxy or phenyl,

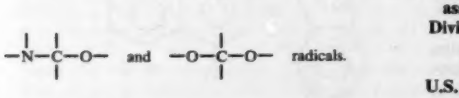
R_{13} is hydrogen; C_{1-4}alkyl; phenyl(C_{1-4}alkyl); 2-pyridyl; cyclohexyl; phenyl; phenyl monosubstituted by fluoro, chloro, bromo, C_{1-4}alkyl, C_{1-2}alkoxy, nitro or trifluoromethyl; 2,3-, 2,4-, 2,5-, 2,6- or 3,4-dichlorophenyl; 2,4- or 3,5-dibromophenyl; 2,3-, 2,4-, 2,5-, 2,6- or 3,5-dimethylphenyl; 3,4-dimethoxyphenyl; 3-, 4- or 5-chloro-2-methylphenyl; 4-bromo-2-methylphenyl or 5-chloro-2-methoxyphenyl, and

Y_2 is hydrogen or 5- or 6-SO_2NHR_{10}, wherein R_{10} is hydrogen, C_{1-4}alkyl or C_{2-4}hydroxyalkyl,

X is hydrogen or nitro,

$M^{\oplus}$ is hydrogen or an equivalent of a non-chromophoric cation, and

M is an equivalent of a non-chromophoric cation, with the provisos that (i) Y_2 must be hydrogen when R_2 is $-SO_2NR_3R_4$ and (ii) the complex is free of



radicals.

4,159,984

REDUCTIVE CLEAVAGE OF OXAZOLIDINE COMPOUNDS

Mitsuru Yoshioka, Toyonaka; Teruji Tsuji, Takatsuki; Yasuhiro Nishitani, Izumi, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

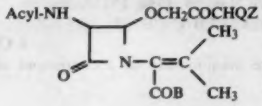
Filed Apr. 25, 1977, Ser. No. 790,618

Claims priority, application Japan, Apr. 27, 1976, 51/49274

Int. Cl. C07D *205/08*

U.S. Cl. 260—239 A **1 Claim**

1. A process for preparing compounds of the following formula:



(I)

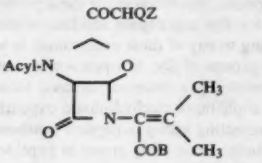
wherein

Acyl is an acyl of a carboxylic acid group;

COB is carboxy or protected carboxy;

Q is hydrogen, lower alkyl, phenyl, tolyl, methoxyphenyl, chlorophenyl or isopropylphenyl; and

Z is hydrogen or a nucleophilic group which comprises reducing a compound of the formula



(II)

by means of a reducing agent which is a reducing metal selected from the group consisting of zinc, iron, tin, magnesium, aluminum and titanium in combination with a proton donor selected from the group consisting of hydrogen chloride, hydrogen bromide, ammonium chloride, ammonium bromide, toluene-p-sulfonic acid, benzenesulfonic acid, methane-sulfonic acid, sulfuric acid, phosphoric acid, nitric acid, acetic acid, trichloroacetic acid, and trifluoroacetic acid, said nucleophilic group being selected from the group consisting of halogen, alkoxy, aralkoxy, aryloxy, acyloxy, hydroxy, alkylthio, aralkylthio, arylthio, acylthio, mercapto, sulfo, alkylsulfonyl, aliphatic or aromatic amino, and amino said nucleophilic groups which contain carbon atoms containing up to 10 carbon atoms.

4,159,985

HETEROCYCLIC PHENYL ESTER ULTRAVIOLET STABILIZERS

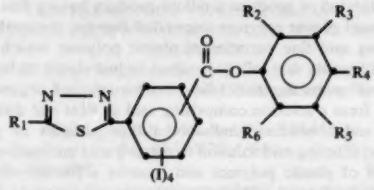
Gether Irick, Jr., and Charles A. Kelly, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 484,844, Jul. 1, 1974, Pat. No. 4,020,080. This application Feb. 1, 1977, Ser. No. 765,509

Int. Cl.[2] **C07D** *285/12*

U.S. Cl. 260—302 D **11 Claims**

1. A composition of matter having the formula



wherein

R_1 is hydrogen, chloro, bromo, lower alkyl, chloro substituted lower alkyl, cyclohexyl, phenyl, lower alkylphenyl, phenyl-substituted-phenyl, alkoxy containing 1 to 20 carbon atoms, dimethyl substituted amino, phenyl substituted with not more than two members of the group consisting of chloro, phenyl, cyano, lower alkyl and alkoxy containing 1 to 20 carbon atoms, and cyano;

I is the same as R_1 and is present on all four available positions of the benzenoid ring, the carboxyl connecting group being attached to the benzenoid ring in either the meta or para position from the carbon atom attached to the heterocyclic ring; and at least one of R_2 or R_6 is hydrogen and the other R_2, R_3, R_4, R_5 and R_6 are hydrogen or not more than three members of the group consisting of lower alkyl, cyclohexyl, phenyl, lower alkylphenyl, alkoxy containing 1 to 20 carbon atoms, phenyloxy, hydroxy, nitrile, chloro and bromo.

4,159,986

NOVEL THIOPHENE-ACETIC ACIDS

Francois Clémence, Rosny-sous-Bois, and Odile Le Martret, Paris, both of France, assignors to Roussel Uclaf, Paris, France

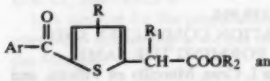
Continuation-in-part of Ser. No. 229,554, Feb. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 88,125, Nov. 9, 1970, abandoned. This application Sep. 4, 1975, Ser. No. 610,110

Claims priority, application France, Nov. 12, 1969, 69.38734; Mar. 11, 1971, 71.08476

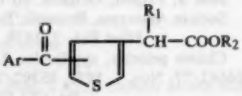
Int. Cl.[2] **C07D** *333/24;* **A01N** *9/00*

U.S. Cl. 260—332.2 A **19 Claims**

1. A thiophene-acetic acid compound of the formula selected from the group consisting of



and



wherein R is selected from the group consisting of hydrogen and methyl, R_1 is selected from the group consisting of lower alkyl of 1 to 4 carbon atoms and hydrogen and R_2 is selected from the group consisting of hydrogen, lower alkyl of 1 to 7 carbon atoms, 2,3-dihydroxy-propyl, di-lower alkylamino-lower alkyl, alkali metals, alkaline earth metals, aluminum and —H, NH (lower alkyl)$_2$ and Ar is selected from the group consisting of phenyl, phenyl substituted with a member selected from the group consisting of chlorine, methoxy and trifluoromethyl; wherein the second formula

is attached to one of the positions α to the sulfur atom.

4,159,987

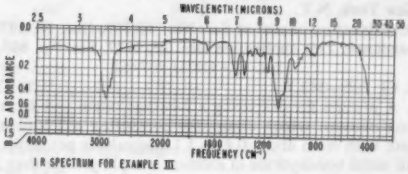
PROCESS FOR PREPARING SUBSTITUTED CYCLIC ACETALS OF OXYACETALDEHYDES AND SAID CYCLIC ACETALS

Mark A. Sprecker, Sea Bright; John J. Kryschuk, Howell, and John B. Hall, Rumson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 811,480, Jun. 30, 1977, abandoned. This application May 3, 1978, Ser. No. 902,390

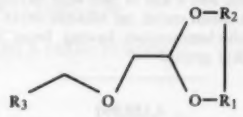
Int. Cl.[2] **C07D** *317/10*

U.S. Cl. 260—340.9 R **2 Claims**

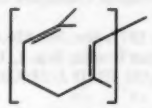


I R SPECTRUM FOR EXAMPLE III

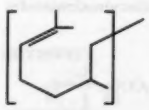
1. A compound having the structure:



wherein R_3 is selected from the group consisting of moieties having the structures:



; and



and R_1 and R_2 taken together form a C_2–C_4 alkylene moiety.

4,159,988

SYNTHETIC PHOSPHOLIPIDS, A PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Hansjörg Eibl, Bovenden; Walter Diembeck, Göttingen, and Stephen Kovatchev, Göttingen-Roringen, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Continuation of Ser. No. 602,181, Aug. 5, 1975, abandoned. This application Jan. 18, 1978, Ser. No. 870,326

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1974, 2437832

Int. Cl.[2] **C07D** *317/00;* **A23J** *7/00;* **C07F** *9/02;* **C11C** *3/00*

U.S. Cl. 260—340.9 R **9 Claims**

8. 1-myristoyl-propanediol-3-phosphoric acid-4-trimethylaminobutylester.

4,159,989
PROCESS FOR PREPARING ETHYLENE GLYCOL DIACYLATE

George R. Wood, Winfield, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 2, 1977, Ser. No. 792,882
Int. Cl.[2] C07D *307/32;* C07C *69/16*
U.S. Cl. 260—343.6 9 Claims

1. The process of disproportionating an acyloxyethylmercuric acylate to ethylene glycol diacylate which comprises heating a composition consisting essentially of an aliphatic carboxylic acid and an acyloxyethylmercuric acylate with a catalytic concentration of perchloric acid.

4,159,990
REDUCTION OF 2,5-DIKETOGLUCONIC ACID

Glenn C. Andrews, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 749,509, Dec. 10, 1976, abandoned. This application Oct. 20, 1977, Ser. No. 843,946
Int. Cl.[2] C07D *307/62*
U.S. Cl. 260—343.7 16 Claims

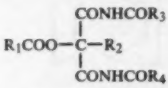
1. A process for preparing a 2-ketogulonate and 2-ketogluconate mixture which comprises contacting a 2,5-diketogluconate with from about 0.8 to 1.1 equivalents per mole of an alkali metal borohydride in solution at a pH greater than 5 and a temperature between about −30° C. and 50° C., said 2,5-diketogluconate being selected from 2,5-diketogluconic acid, a normal alkyl ester of said acid wherein said alkyl group is of 1 to 4 carbon atoms, and a salt of said acid having a counterion selected from an alkali metal, an alkaline earth metal, ammonium and tetraalkylammonium having from 1 to 4 carbon atoms in each alkyl group.

4,159,991
ACYLOXY-N,N'-DIACYLMALONAMIDES AND METHODS FOR THEIR PREPARATION

Bernard Dubreux, Francheville le Bas; Serve Y. Delavarenne, Francheville le Haut, and Jean-Pierre Schirmann, Oullins, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Aug. 22, 1977, Ser. No. 826,478
Claims priority, application France, Sep. 1, 1976, 76 26324
Int. Cl.[2] C07C *143/90;* C11D *1/28;* C09F *5/00*
U.S. Cl. 260—401 12 Claims

1. α-Acyloxy-N,N'-diacylmalonamides of the formula



wherein R_1, R_2, R_3, and R_4 are the same or different and are hydrogen, straight-chain or branched-chain alkyl radicals having from one to eleven carbon atoms, or hydrocarbon radicals having from six to twelve carbon atoms and containing at least one aromatic ring.

2. α-Acyloxy-N,N'-diacylmalonamides according to claim 1 wherein at least one radical is substituted by a nitro, hydroxy, alkoxy, carboxylic ester or amide, ether oxide, amino, sulfoxide, sulfone, or sulfonic acid group; by fluorine, chlorine, bromine, or iodine; or by a halogenated hydrocarbon group.

4,159,992
REMOVAL OF PLASTIC POLYMER FINES FROM TALLOW

Constantine D. Miserlis, Arlington, Mass., assignor to The Badger Company, Inc., Cambridge, Mass.

Filed Jul. 3, 1978, Ser. No. 921,735
Int. Cl.[2] C11B *1/12;* C11C *1/04;* C09F *5/10*
U.S. Cl. 260—412.6 16 Claims

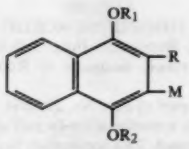
14. In the rendering of raw animal fat to produce tallow, wherein a raw animal fat feedstock in plastic polymer containers is digested to produce a tallow product having fine particles of said plastic polymer suspended therein, the method of removing said fine particles of plastic polymer which comprises: adjusting said tallow product to just above its freezing point and contacting said tallow with a selected organic solvent to form a solution comprising said solvent and dissolved tallow and containing undissolved fine particles of plastic polymer; filtering said solution to remove said undissolved fine particles of plastic polymer and recover a filtrate which is substantially free of said plastic polymer; treating said filtrate to separate said solvent and dissolved tallow, and recycling said separated solvent for contacting additional tallow.

4,159,993
3-METALLO SUBSTITUTED NAPHTHALENES

Henry Rapoport, Berkeley, and Clinton D. Snyder, Monte Sereno, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 565,473, Apr. 7, 1975, Pat. No. 4,089,873, which is a continuation-in-part of Ser. No. 540,450, Jan. 13, 1975, abandoned. This application Jul. 14, 1977, Ser. No. 815,771
Int. Cl.[2] C07F *1/08*
U.S. Cl. 260—438.1 12 Claims

1. Compounds of the formula



wherein R is lower alkyl and R_1 and R_2 are lower alkyl, or aralkyl of 7 to about 12 carbon atoms, and M is selected from the group consisting of $(CuLi)_1$ and Cu.

4,159,994
KAOLIN INTERCALATION COMPLEXES AND PROCESSES FOR FORMING THE SAME

Herbert Seto, Orleans; Maria I. Cruz, Marcilly en Villette, and Jose J. Fripiat, Orleans, all of France, assignors to Unibra Societe Anonyme, Brussels, Belgium

Filed Feb. 2, 1978, Ser. No. 874,603
Claims priority, application United Kingdom, Feb. 4, 1977, 04642/77; Nov. 1, 1977, 45392/77
Int. Cl.[2] C07F *5/06*
U.S. Cl. 260—448 C 31 Claims

1. Process for preparing new intercalation complexes of kaolin materials having organic compounds or radicals in their chemical structure, said compounds or radicals being selected from

the ammonium salts of carboxylic acids having more than two carbon atoms,

the alkali metal salts of carboxylic acids having more than two carbon atoms,

said process comprising

(1) reacting a member selected from the group consisting of a kaolin-hydrazine complex and a kaolin-ammonium acetate complex with a solution of an ammonium or alkali metal salt of a carboxylic acid having more than two carbon atoms.

4,159,995
CONVERSION OF SYNTHESIS GAS TO HYDROCARBON MIXTURES UTILIZING DUAL REACTORS

Werner O. Haag, Lawrenceville, and Tracy J. Huang, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,487
Int. Cl.[2] C07C *1/04*
U.S. Cl. 260—450 **6 Claims**

1.In a process for converting synthesis gas comprising carbon monoxide and hydrogen to gasoline boiling components wherein synthesis gas is contacted in a first reactor under conditions of elevated temperatures and pressure with an iron containing Fishcher-Tropsch catalyst and the total product from said first reactor is passed to a second reactor containing an acidic crystalline zeolite having a pore diameter greater than about five Angstroms, a silica to alumina ratio of at least 12, a crystal density substantially below 1.6 grams per cubic centimter and a constraint index of from 1 to 12 the improvement which comprises:

(a) carrying out said contact in said first reactor at a temperature of from 450° to 670° F., a pressure of from atmospheric to 1500 psig and a weight hourly space velocity of from 0.1 to 10.

(b) operating said second reactor at a temperature of from 530° F. to about 850° F., a pressure of from atmospheric to about 1500 psig and at a weight hourly space velocity of from 0.2–30, and

(c) recovering a C_5+ gasoline fraction in a yield of at least 40 weight percent based on the total hydrocarbons produced, said gasoline fraction having a boiling range of less than 400° F. at a 90% overhead, and

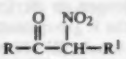
(d) producing methane plus ethane in a amount no greater than 25 weight percent.

4,159,996
PREPARATION OF ALKANE DIAMINES

Richard F. Love; Stanley R. Newman, both of Fishkill, N.Y., and John M. Larkin, Austin, Tex., assignors to Texaco Inc., New York, N.Y.

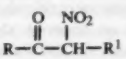
Filed Oct. 31, 1977, Ser. No. 847,193
Int. Cl.[2] C07C *85/08*
U.S. Cl. 260—570.5 P **25 Claims**

1. A method for the preparation of an alkane diamine which comprises contacting a vicinal nitroketone corresponding to the formula:



where R is an alkyl group of from 1 to 20 carbon atoms and where R^1 is hydrogen or an alkyl group having 1 to 20 carbon atoms and a primary amine hydrochloride thereby forming a nitroalkyliminoalkane or a nitrooximinoalkane and thereafter catalytically hydrogenating said nitroalkyliminoalkane or said nitrooximinoalkane.

14. A method for the preparation of a nitrooximinoalkane or a nitroalkyliminoalkane which comprises contacting a vicinal nitroketone corresponding to the formula:



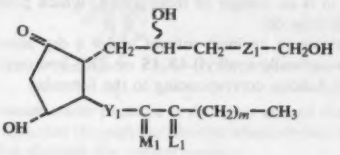
where R is an alkyl group of from 1 to 20 carbon atoms and where R^1 is hydrogen or an alkyl group having 1 to 20 carbon atoms and a primary amine hydrochloride.

4,159,997
2-DECARBOXY-2-HYDROXYMETHYL-6-HYDROXY-PGE$_1$ COMPOUNDS

Herman W. Smith, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 812,794, Jul. 5, 1977, Pat. No. 4,131,738. This application Jun. 23, 1978, Ser. No. 918,525
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—586 R **34 Claims**

1. A prostacyclin analog of the formula



wherein Z_1 is

(1) $-(CH_2)_g-CH_2-CH_2-$,
(2) $-(CH_2)_g-CH_2-CF_2-$, or
(3) trans-$(CH_2)_g-CH=CH-$,
wherein g is the integer one, 2, or 3;

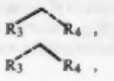
wherein Y_1 is

(1) trans-CH=CH—,
(2) cis-CH=CH—,
(3) $-CH_2CH_2-$,
(4) trans-CH=C(Hal)—, or
(5) —C≡C—,
wherein Hal is chloro or bromo;

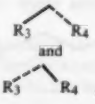
wherein M_1 is

wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive;

wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and

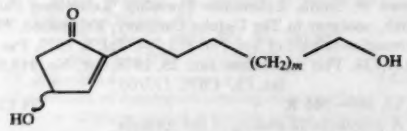
wherein m is the integer one to 5, inclusive.

4,159,998
PROCESS FOR THE PREPARATION OF 2-(7-HYDROXYALKYL)-4R, 4S OR 4RS -HYDROXY-CYCLOPENT-2-ENONE

Harold C. Kluender, Madison, Wis., assignor to Miles Laboratories, Inc., Elkhart, Ind.

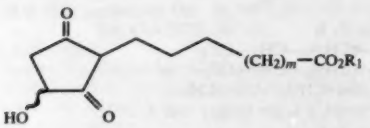
Filed Sep. 11, 1978, Ser. No. 940,977
Int. Cl.[2] C07C *45/00*
U.S. Cl. 260—586 R **25 Claims**

1. A process for the preparation of 2-(ω-hydroxyalkyl)-4R,4S or 4RS-hydroxy-cyclopent-2-enone corresponding to the formula:



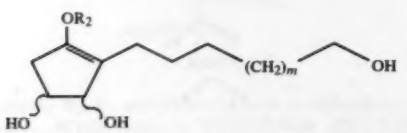
wherein m is an integer of from 2 to 4, which process comprises the steps of:

A. reacting in an inert solvent under a dry atmosphere a 2-(ω-carboalkoxyalkyl)-4R,4S or 4RS-hydroxycyclopentan-1,3-dione corresponding to the formula:



wherein m is an integer of from 2 to 4 and R_1 is an alkyl group containing from 1 to 4 carbon atoms, with mesitylenesulfonyl chloride, a lower alkyliodide of from 1 to 4 carbon atoms or benzoyl chloride in the presence of an excess of a tertiary or aromatic amine to convert the starting material to the corresponding enol sulfonate, enol ether or enol benzoate;

B. reacting in an inert solvent and under an inert atmosphere the so-formed enol sulfonate, enol ether or enol benzoate with an excess of a metallic hydride reducing agent capable of reducing the ester and carbonyl group on the enol sulfonate, ether or benzoate to primary and secondary alcohol groups respectively, at a temperature not in excess of about 35° C. to reduce the carbonyl group on the starting material to a hydroxyl group and to reduce the ester group on the starting material to an alcohol group to thereby form an intermediate material corresponding to the formula:



wherein R_2 is mesitylenesulfonyl, lower alkyl or benzoyl and m is an integer from 2 to 4;

C. adding a dilute aqueous solution of a mineral acid and a water immiscible organic solvent to the reaction mass to convert unreacted amine to its corresponding amine salt and cause the amine salt to reside in the so-formed aqueous phase and cause the intermediate material formed in step B to reside in the so-formed organic phase;

D. separating the aqueous phase from the organic phase;

E. washing the organic phase with an aqueous base to remove the acid therefrom;

F. separating the intermediate material formed in step B from the organic phase; and

G. dissolving the intermediate material in chloroform, methylene chloride, a lower alcohol or a mixture thereof and reacting it with sodium oxalate and oxalic acid to form the desired product.

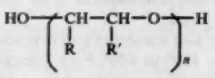
4,159,999

HYDROFORMYLATION OF OLEFINS

Adin L. Stautzenberger; James L. Paul, and Jerry D. Unruh, all of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 22, 1974, Ser. No. 526,298
Int. Cl.[2] C07C *45/08*
U.S. Cl. 260—604 HF **8 Claims**

1. In the process for the hydroformylation of olefins with hydrogen and carbon monoxide in a reaction zone to form aldehydes, alcohols and mixtures thereof in which a catalytic complex comprising a Group VIII metal, carbon monoxide and a ligand is formed in situ, the improvement comprising the introduction of the Group VIII metal into said zone in the form of a water-soluble inorganic salt dissolved in a solvent comprised of at least about 40% of a polyalkylene glycol selected from compounds having the following structure and mixtures thereof:



wherein n is 1–3, and R and R′ are selected from —H and $-CH_3$.

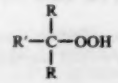
4,160,000

EXTRACTION OF HYDROPEROXIDES

John F. Hutto, and Alfred A. Hoffman, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 13, 1978, Ser. No. 886,029
Int. Cl.[2] C07C *179/02*
U.S. Cl. 568—576 **9 Claims**

1. A process for the recovery of an organic hydroperoxide, said hydroperoxide being represented by the following general formula



in which R can be hydrogen, an alkyl radical of 1 to 4 carbon atoms, taken together the R groups can form a cycloalkyl ring of from 4 to 7 carbon atoms, R′ can be R, an aryl radical of from 6 to 10 carbon atoms, an alkyl substituted aryl radical of from 7 to about 22 carbon atoms and said hydroperoxides contain from 4 to about 30 carbon atoms per molecule from a reaction mixture containing the same and unreacted corresponding hydrocarbon from which it has been produced which comprises, in a first step, extracting said mixture with an aqueous alcoholic solvent having a concentration in the approximate range of 80–95 wt. % alcohol to obtain an extract containing a higher percentage of hydroperoxide and, in a second step, adding to said extract a limited amount of water only sufficient to reject primarily only an oily layer containing a minor proportion of hydroperoxide and a major proportion of the hydrocarbon and an aqueous alcoholic solution phase containing hydroperoxide suitable for use in the acid-catalyzed decomposition for the production of carbonyl and hydroxy compounds, the amount of water added to said extract being limited to between from about 2 to about 50 wt. % based on the weight of the extract.

4,160,001

COPOLYMER BLENDS

Irving Rosen, Warrensville Heights, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 18, 1977, Ser. No. 825,643

Int. Cl.[2] C08L *51/04*

U.S. Cl. 525—230 **6 Claims**

1. A blend of from 2 to 60% by weight of

I. a copolymer of from about 50 to 70% by weight of methyl methacrylate and correspondingly from about 50 to 30% by weight of styrene, and from 98 to 40% by weight of

II. a copolymer prepared by the polymerization of 100 parts by weight of

(A) more than 50% by weight of at least one nitrile having the structure

$$CH_2=\underset{\displaystyle R}{\underset{|}{C}}-CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

(B) less than 50% by weight based on the combined weights of (A) plus (B) of styrene, in the presence of from 0 to 40 parts by weight of

(C) a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally at least one comonomer selected from the group consisting of styrene, a nitrile monomer having the structure

$$CH_2=\underset{\displaystyle R}{\underset{|}{C}}-CN$$

wherein R has the foregoing designation, and an ester having the structure

$$CH_2=\underset{\displaystyle R_1}{\underset{|}{C}}-COOR_2$$

wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms, said rubbery polymer containing from 50 to 100% by weight of polymerized conjugated diene and from 0 to 50% by weight of comonomer.

4,160,002

STEAM INJECTORS

Viacheslav J. Janovtchik, 16, Hedley Ct., 67 Putney Hill, London SW15 3NS, England

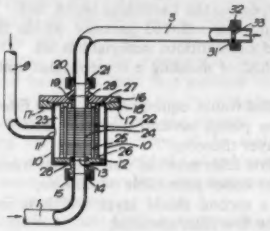
Continuation of Ser. No. 804,657, Jun. 8, 1977, abandoned. This application Sep. 26, 1978, Ser. No. 945,994

Claims priority, application United Kingdom, Jun. 9, 1976, 23895/76

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—76 **7 Claims**

1. A steam injector for heating a flowable product, comprising: a closed injection chamber having an inlet to said chamber for the product to be heated, an outlet from said chamber for the heated product, and an inlet for steam under pressure, a stack of planar discs held together within the chamber, between the product inlet and outlet with a space for steam under pressure around the periphery of the stack, each disc having a central hole, which holes define a central passage communicating at one end with said inlet for the product to be heated and at the other end with said outlet for the treated product, the planes of the discs being perpendicular to the direction of flow of the product, one face of each disc being formed with a plurality of non-radial chordal channels running parallel to each other from the periphery of the disc to the central hole, the chordal channels being offset from the radial chords of the disc, and a steam supply pipe connected to the steam inlet to



maintain steam under pressure in the space around the stack of discs for injection through the chordal channels into the product flowing through the central passage.

4,160,003

METHOD OF MOLDING CEMENTITIOUS MATERIAL

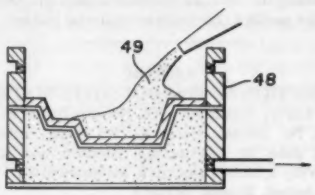
Mikio Kozuka, Yokohama; Isao Ono, Kawasaki, and Takashi Fukuwatari, Tokyo, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 659,081, Feb. 18, 1976, abandoned. This application Dec. 1, 1977, Ser. No. 856,588

Claims priority, application Japan, Feb. 18, 1975, 50-19429; Feb. 18, 1975, 50-19430

Int. Cl.[2] B28B *1/26*

U.S. Cl. 264—87 **11 Claims**



1. A method of molding cementitious material comprising:

charging wet cementitious material into a molding mold;

disposing a first mold frame about the wet cementitious material;

charging filler material under air permeable conditions directly onto the wet cementitious material;

disposing a shield layer which is impermeable over the filler material;

fixing the filler material under reduced pressure caused by suction applied through a source of suction to form a hardening mold;

retaining the cementitious material on the hardening mold; and

permitting the cementitious material is set upon the hardening mold.

10. A method of molding a wet cementitious material comprising:

charging a slurry of wet cementitious material into a molding mold;

placing a frame, equipped with a filter connected to a suction pump around the molding mold;

charging a filler material directly onto the wet cementitious material;

disposing a shield layer which is impermeable to cover the filler material;

fixing the filler material within the frame under a reduced

pressure condition caused by suction through the filter to form a hardening mold;

detaching the molded cementitious material from the molding mold and retaining the molded cementitious material with respect to the hardening mold; and

discontinuing the reduced pressure within the frame after the mold cementitious material has set.

11. A method of molding a cementitious material comprising:

placing a first frame, equipped with a first filter connected to a suction pump, around a master model having a first shield layer thereon;

charging first filler material into the first frame to cover the first filter under permeable conditions;

disposing a second shield layer which is impermeable to cover the first filler material;

turning upside down the master model, the first and second shield layers, the first frame and the first filler material;

fixing the first filler material under a reduced pressure condition caused by suction through the first filter to form a first mold;

removing the master model;

charging a slurry of cementitious material into the first mold;

placing a second frame, equipped with a second filter connected to the suction pump, upon the first frame;

charging a second filler material onto the cementitious material;

disposing a third shield layer which is impermeable to cover the second filler material;

fixing the second filler material within the second frame under a reduced pressure condition caused by suction through the second filter to form a second mold;

detaching the molded cementitious material from the first mold and retaining the molded cementitious material with respect to the second mold; and

discontinuing the reduced pressure within the second frame after the molded cementitious material has set.

4,160,004

PRODUCTION OF FIBROUS SHEET MATERIAL

Harold G. Curry, Hambrook, Nr. Bristol; Brian W. Attwood, Hanham, Nr. Bristol; Derek G. W. White, Bristol, all of England; John M. Christensen, Risskov, and Karl K. K. Kroyer, Viby J, both of Denmark, assignors to Karl Kroyer St. Anne's Limited, Bristol, England

Continuation of Ser. No. 375,094, Jun. 29, 1973, abandoned. This application Jul. 26, 1976, Ser. No. 708,384

Claims priority, application United Kingdom, Jul. 8, 1972, 32098/72

Int. Cl.[2] **D04H** *1/64*

U.S. Cl. 264—120 **12 Claims**

1. A method of producing a self-sustaining sheet including essentially cellulosic fibrous material comprising:

(a) dry laying a web of essentially cellulosic fibres upon a movable support surface, wherein the web includes a binder,

(b) moistening said dry-laid web with water in an amount into subsequently bond the web to a consolidated sheet under subsequently applied pressure,

(c) moving said moistened web with said movable support surface to a first pressure nip between a first pressure roll and a heated consolidating surface, with a supporting band located against the web on the side thereof opposite from the consolidating surface, wherein the consolidating surface together with the first pressure roll, the latter acting through the supporting band, exert on the moistened heated web therebetween uniformly across the width of the web a pressure of between 150 to 500 pounds per linear inch to consolidate the web,

(d) maintaining the supporting band against the web after the web leaves the first pressure nip to continue to urge the web against the heated consolidating surface between the first pressure nip and a second pressure nip spaced from the first pressure nip to maintain, between the first and second pressure nips, a pressure exerting the web against the consolidating surface,

(e) moving the web into the said second pressure nip, which is formed between the said heated consolidating surface and a second pressure roll with the supporting band against the web on the side thereof opposite from said heated consolidating surface, wherein the heated consolidating surface and the second pressure roll, the latter acting through the supporting band, exert on the moistened heated web therebetween uniformly across the width of the web a pressure of between 150 to 500 pounds per linear inch to further consolidate the web to strengthen it, and

(f) removing the web, now a self-sustaining sheet, from the second pressure nip.

4,160,005

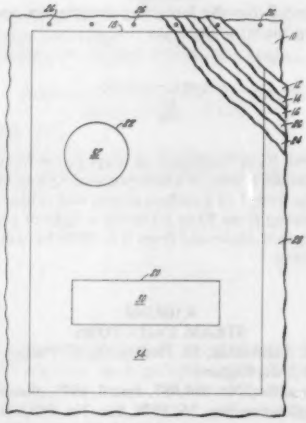
METHOD OF FABRICATING A SELECTIVELY SHAPED AND APERTURED PART OF FIBER REINFORCED PLASTIC

Robert K. Renkowsky, Bridgeport, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 7, 1977, Ser. No. 848,954

Int. Cl.[2] **B29G** *5/00;* **B29D** *3/02*

U.S. Cl. 264—137 **3 Claims**



1. The method of fabricating a selectively shaped, contoured and apertured part of fiber reinforced plastic comprising the steps of:

(A) providing a mold of the part final shape,

(B) laying-up upon the mold the desired number of layers of preimpregnated and uncured fiber reinforced plastic,

(C) cutting through the layers so laid-up around the outer periphery of the part being fabricated and around the periphery of all apertures therein,

(D) curing the layers so laid-up with the waste material so cut in place,

(E) removing the cured material from the mold, and

(F) pressing the cured waste material so cut away from the cured material of the part being fabricated to cause severance of the waste material from the finished part along the smooth lines established by the cutting process.

4,160,006

PROCESS AND DEVICE FOR THE MANUFACTURE OF A TUBE BEND OF A THERMOPLAST

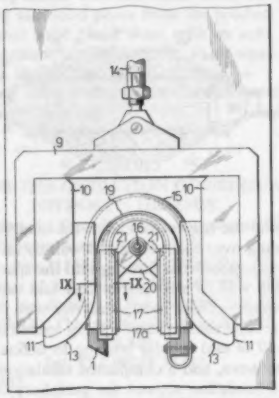
Alfred Patzner, Schwalbach, and Josef Kruger, Kahlbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,939

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2709996

Int. Cl.[2] B29C *17/02*

U.S. Cl. 264—292 1 Claim



1. Process for the manufacture of a tube bend of a thermoplast by heating a straight tube length to a temperature in the optimum thermoforming range of the plastic material, introducing a supporting core into the interior of the tube and bending the tube length around a bending template, which comprises heating the tube length, introducing into the hot tube a core consisting of lamellae capable of being shifted against one another, placing an elastic, extensible insert between the tube and a circular disk the radius of which disk corresponds to the inner bending radius of the tube bend to be produced less the thickness of the insert and bending the tube round the circular disk, whereby the stretching insert causes an expansion of the inner surface of the tube bend.

4,160,007

METHOD AND IMPROVED APPARATUS FOR AUTOMATICALLY HANDLING A MOLD FOR TIRES WITH A RIGID SEGMENTED CORE

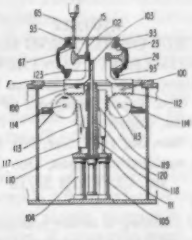
Augusto Pizzorno, Milan, Italy, assignor to Industrie Pirelli, S.p.A., Milan, Italy

Filed Sep. 6, 1977, Ser. No. 830,870

Claims priority, application Italy, Sep. 13, 1976, 27139 A/76

Int. Cl.[2] B29H *17/38*

U.S. Cl. 264—334 2 Claims



1. A method of disassembling and reassembling a mold for making a tire, said mold consisting essentially of an outer envelope and an inner body joined to define the required shape of the tire, said inner body consisting of a core having sectors which can be radially taken into pieces, with radial extensions towards the inside of the core and at least two annular elements, an upper one and a lower one, separable from each other and from the core in the direction of the core axis, said annular element having at least two surfaces forming axially inner surfaces for the bead of the tire to be made, said method consisting essentially of the following phases:

(a) removing the outer envelope of the mold around the tread of the tire already molded and vulcanized as well as of those zones of the envelope that prevent the sectors of the core from entering;

(b) supporting the sectors of the core in such a way that their center line plane is horizontal and coincides with the equatorial plane of the tire;

(c) applying forces to the lower annular element sufficient to remove it from the core in the direction of the core axis in order to spread out the sidewall of the tire below the center line plane of the core and then sufficient to thrust the sidewall overhanging said center line plane and the zone of the tread near said overhanging sidewall against the corresponding profiles of the sectors and at the same time for locking the bead below the center line plane in such a way as to keep it in contact with the surface of the lower annular element that formed the axially inner surface of said bead below;

(d) discontinuing said forces applied to the lower annular element to remove it from the core during phase (c) and at the same time stopping said lower annular element with further forces in such a way as to go on with pressing the sidewall overhanging said center line plane and the zone of the tread near said sidewall overhanging the corresponding profiles of the sectors;

(e) applying to the upper annular element the forces previously applied during phase (c) to the lower annular element with the same intensity and in the opposite direction in such a way as to remove said upper annular element from the core in order to spread out the sidewall of the tire overhanging the center line plane in such a way as to keep it in contact with the surface of the upper annular element that formed the axially inner surface of said overhanging bead;

(f) stopping said upper annular element when it reaches a position which is symmetrical with respect to the position reached at the end of phase (c) by the lower annular element relative to the equatorial plane of the mold;

(g) radially moving a first part of the sectors towards the axis of the core and then in the direction of the core axis in order to allow the radial contraction of the remaining sectors and to contract said remaining sectors;

(h) releasing the bead below said center line plane from the lower annular element and at the same time dragging the whole tire, by now released from the lower annular element, with the upper annular element over the sectors and starting with the extraction of the tire;

(i) expanding all the sectors against an annular stiffening structure for the tire placed in such a manner as to have the median line aligned with the center line plane;

(l) applying forces to the upper annular element to bring it again in contact with the sectors;

(m) discontinuing said further forces which kept the lower annular element in the final position reached at the end of phase (d);

(n) applying to the lower annular element the forces applied in phase (l) to the upper annular element in the opposite direction in order to bring said lower annular element into contact with the sectors;

(o) rebuilding the outer envelope of the mold to mold and vulcanize a new tire; and

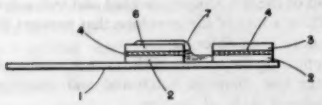
(p) repeating the preceding phases cyclically for the manufacture of additional tires.

4,160,008

MULTILAYERED TEST DEVICE FOR DETERMINING THE PRESENCE OF A LIQUID SAMPLE COMPONENT, AND METHOD OF USE

Leonard P. Fenocketti, Tolland, Conn., and Myron C. Rapkin, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jan. 26, 1978, Ser. No. 872,560
Int. Cl.[2] G01N *31/22, 33/16*
U.S. Cl. 422—56 **16 Claims**



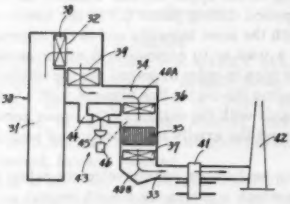
1. Test means for determining the presence of a constituent in a liquid sample, said test means comprising a layer of absorbent material having fixedly laminated to each of the opposite faces thereof respectively, a substantially liquid impervious layer, and a reagent layer overlaying at least one of said liquid impervious layers.

4,160,009

BOILER APPARATUS CONTAINING DENITRATOR

Ko'hei Hamabe, Osaka, Japan, assignor to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Jul. 14, 1977, Ser. No. 815,722
Claims priority, application Japan, Jul. 27, 1976, 51-89972; Jul. 27, 1976, 51-100548[U]
Int. Cl.[2] B01J *8/02;* C01B *21/00*
U.S. Cl. 422—108 **9 Claims**



1. In a boiler apparatus having a furnace and a plurality of heat exchangers disposed in a combustion gas channel between the furnace and boiler apparatus exits, the improvement comprising,

a denitrator having a catalyst disposed in said combustion gas channel downstream of at least one of said heat exchangers,

a bypass duct for said combustion gas channel connecting a first region thereof in which said denitrator is disposed with a second region upstream of said first region,

control valve means disposed in said duct, and

a temperature detector disposed in said first region and connected to said control valve means so as to control the opening and closing of said valve means in response to the temperature detected in said first region by said detector.

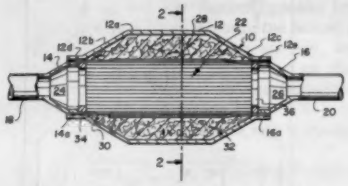
4,160,010

DEVICE FOR PURIFYING EXHAUST GASES

Walter Öttle, Faurndau, Fed. Rep. of Germany, assignor to J. Eberspächer, Fed. Rep. of Germany

Continuation of Ser. No. 690,864, May 28, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,306
Int. Cl.[2] B01J *35/04, 8/02, 3/15*
U.S. Cl. 422—180 **12 Claims**

1. A device for purifying exhaust gases in an internal combustion engine, comprising a tubular housing having an outer wall with a first end having an inlet for exhaust gases and an opposite second end having an exhaust gas discharge, a catalyst carrier disposed in said housing and having a plurality of axially extending catalyst containing gas passages extending therethrough defining individual catalyst gas flow passages from said inlet to said outlet, said catalyst carrier having an end wall at each end and a side peripheral wall, first and second foil sheets, each having inner portions covering a portion of said catalyst carrier and outer portions extending beyond the respective end of the catalyst carrier, ring means securing the outer ends of each first or second sheet to the interior of said



housing beyond the respective end of the catalyst carrier, said sheets extending over said peripheral wall by an amount sufficient to prevent gases from flowing into the space around said peripheral side wall of said carrier and said tubular housing, said side periphery of said catalyst carrier with the portions of the first and second sheets thereon being spaced inwardly from said outer wall of said tubular housing to define an insulation space therebetween, and a compacted insulation material disposed in said insulation around the periphery of said carrier and bearing against said foil sheets and said carrier to hold said carrier in position in said housing.

4,160,011

CRYSTALLINE ALUMINOSILICATE PERCURSOR

John H. Estes, Wappingers Falls; Stanley Kravitz, Fishkill, and Robert M. Suggitt, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 536,711, Dec. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 272,089, Jul. 14, 1972, abandoned. This application Dec. 29, 1977, Ser. No. 865,452
Int. Cl.[2] C01B *33/28*
U.S. Cl. 423—328 **17 Claims**

1. A process for preparing an amorphous precursor for crystalline aluminosilicates which comprises:

(a) forming under ambient conditions a sodium aluminum silicate water mixture sufficient for the formation a type 4A zeolite and having a composition, in terms of oxide mole ratios, of Na_2O/SiO_2 from 0.8 to 3.0, H_2O/Na_2O from 35 to 200 and SiO_2/Al_2O_3 from 1.3 to 2.5;

(b) removing water from said mixture by extracting the mixture with a water miscible solvent;

(c) recovering the resultant solid material; and

(d) drying the resultant material to produce an amorphous powder.

4,160,012

PROCESS OF REFINING SODIUM HEXAFLUOROSILICATE CONTAINING GYPSUM

Tetsuhiro Ono; Minoru Aramaki; Tamotsu Mizuno, and Masao Fujinaga, all of Ube, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Nov. 30, 1977, Ser. No. 856,134
Claims priority, application Japan, Dec. 3, 1976, 51-144697
Int. Cl.[2] C01B *33/10*
U.S. Cl. 423—341 **9 Claims**

1. A process of refining a crude sodium hexafluorosilicate containing calcium sulfate as an impurity, comprising the steps of:

(a) preparing an aqueous slurry of the crude sodium hexafluorosilicate;
(b) adding an alkali metal compound, which can neutralize sulfuric acid and which is selected from the group consisting of sodium hydroxide, sodium carbonate, sodium hydrogen carbonate, potassium hydroxide, potassium carbonate, potassium hydrogen carbonate and lithium hydroxide, to said slurry to form a solid phase consisting essentially of calcium fluoride and silicon dioxide through decomposition of sodium hexafluorosilicate and calcium sulfate accompanied by the formation of a water soluble sulfate by neutralization of sulfuric acid formed during said decomposition with said alkali metal compound;
(c) separating said solid phase from the product of step (b);
(d) making said solid phase react with an acid, which can form a water soluble calcium salt, in an aqueous solution comprising sodium ions; and
(e) recovering solid phase sodium hexafluorosilicate from the product of step (d).

4,160,013

PROCESS FOR THE OXIDATION OF NITRIC OXIDE TO NITROGEN DIOXIDE

James M. Whelan, La Canada, Calif., assignor to University of Southern California, Los Angeles, Calif.

Division of Ser. No. 712,002, Aug. 5, 1976, Pat. No. 4,082,837, which is a division of Ser. No. 556,670, Mar. 10, 1975, Pat. No. 3,976,599, which is a division of Ser. No. 194,769, Oct. 28, 1971, Pat. No. 3,855,020. This application Dec. 8, 1977, Ser. No. 858,559

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—402 **1 Claim**

1. A process for the selective oxidation of a nitric oxide to nitrogen dioxide in the presence of elemental nitrogen with minimal oxidation thereof, which comprises combining the nit.ic oxide with a predetermined amount of oxygen containing gas to give at least a 1% stoichiometric excess of oxygen for the oxidation of the nitric oxide to nitrogen dioxide and passing the resulting mixture over a ceramic catalyst of the following empirical formula at a temperature between about 100° C. and 400° C.

$$W_kX_nJ_{(1-k-n)}ZO_{(3\pm m)}$$

wherein
W is Zironcium, Tin or Thorium or mixtures thereof;
X is an alkaline earth metal or mixture thereof;
J is scandium attrium a rare-earth element or mixture thereof;
Z is a metal of the first transition series or a mixture thereof, at least 0.01% of said metal having an oxidation state other than +3;
k is a number having a value between 0 and about 0.1;
m is a number having a value of from 0 to about 0.26; and
n is a number having a valve from 0 to about 0.51, provided when n has a value of 0, k has a value between 0 and about 0.05.

4,160,014

HYDROGEN STORAGE MATERIAL

Takaharu Gamo, Fujiidera; Yoshio Moriwaki, Moriguchi; Toshio Yamashita, Katano, and Masataro Fukuda, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed May 10, 1978, Ser. No. 905,176

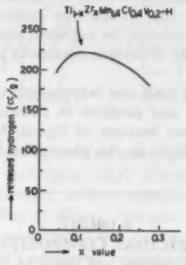
Claims priority, application Japan, May 10, 1977, 52-54140

Int. Cl.[2] C01B *6/02*

U.S. Cl. 423—644 **6 Claims**

1. A material for storage of hydrogen comprising an alloy represented by the formula ABα in which A comprises from 50 to below 100 (exclusive) atomic percent of titanium and remainder being zirconium, B comprises from 30 to below 100 (exclusive) atomic percent of manganese and the remainder containing vanadium and one element selected from the group consisting of chromium and molybdenum, and α is a value indicating the ratio of B to A, and is in the range of 1.0 to 3.0.

6. A hydride of an alloy represented by the formula ABα in which A comprises from 50 to below 100 (exclusive) atomic percent of titanium and remainder being zirconium, B comprises from 30 to below 100 (exclusive) atomic percent of manganese and the remainder containing vanadium and one element selected from the group consisting of chromium and molybdenum, and α is a value indicating the ratio of B to A, and is in the range of 1.0 to 3.0, said hydride being produced by reacting said alloy with hydrogen.



4,160,015

2,4,6-TRIIODOBENZOIC ACID DERIVATIVES AND THEIR USE AS X-RAY CONTRAST AGENTS

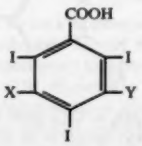
Philip E. Wiegert, Glens Falls, N.Y., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 715,974, Aug. 19, 1976, Pat. No. 4,125,599. This application Aug. 28, 1978, Ser. No. 937,099

Int. Cl.[2] A61K *29/02*; C07C *101/44, 101/72, 103/24*

U.S. Cl. 424—5 **7 Claims**

6. An x-ray contrast medium comprising an aqueous solution of an effective amount of a salt of a compound of the formula:



wherein X is selected from the group consisting of lower acylamino, N-(lower alkyl)-lower acylamino, N-(hydroxy lower alkyl)-lower acylamino, carbamyl and N-(lower alkyl) carbamyl and Y is trishydroxymethylacetamido, with at least one pharmaceutically acceptable cation.

4,160,016

RECEPTOR FLUORESCENT IMMUNOASSAY

Edwin F. Ullman, Atherton, Calif., assignor to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 796,916, May 16, 1977, abandoned, which is a continuation-in-part of Ser. No. 751,838, Dec. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 402,693, Oct. 2, 1973, Pat. No. 3,998,943. This application Aug. 11, 1977, Ser. No. 823,765

The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.

Int. Cl.[2] G01N *21/38, 31/00, 33/16*

U.S. Cl. 424—8 **7 Claims**

1. A method for detecting the presence of a ligand in a samle, when the ligand is of a molecular weight in the range of about

125 to 2,000 and free of heavy atoms of atomic number greater than 35, said method comprising:

combining in an aqueous medium

said sample;

ligand analog-fluorescer wherein said ligand analog has at least one common epitope with said ligand so as to be specifically recognizable by a common antibody, and the ligand analog and fluorescer are linked sufficiently close by a linking group, so that the binding of antiligand to ligand analog reduces the emission intensity of said fluorescer having an aborption maximum above 300 mμ;

antiligand;

determining at at least one wavelength the intensity of the emission from said medium as compared to a standard having a known amount of ligand, by irradiating said medium with light in the absorption band of said fluorescer.

4,160,017
HERBICIDAL COMPOSITIONS

George E. Davies, Wilmslow, and David M. Foulkes, Henley-on-Thames, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 716,801, Aug. 23, 1976, Pat. No. 4,046,552. This application Sep. 6, 1977, Ser. No. 830,765

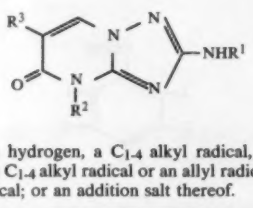
Claims priority, application United Kingdom, Apr. 15, 1976, 15584/76

The portion of the term of this patent subsequent to Sep. 6, 1994, has been disclaimed.

Int. Cl.[2] **A61K** *31/395;* **A01N** *9/22*

U.S. Cl. 424—10 **1 Claim**

1. A method of avoiding the toxifying effect of a salt of a herbicidal bipyridylium quaternary cation which has been ingested by a human which comprises inducing emesis in said human with consequent removal of the herbicidal salt from said human before lethal amounts of the herbicide can be assimilated by the body, said emesis being induced by administering to said human an emetically effective amount of an emetically active s-triazolo (1,5-a) pyrimidine derivative of the formula:



wherein R^1 is hydrogen, a C_{1-4} alkyl radical, or a COOEt radical; R^2 is a C_{1-4} alkyl radical or an allyl radical, and R^3 is a C_{1-4} alkyl radical; or an addition salt thereof.

4,160,018
STABILIZED CANCER ASSOCIATED POLYPEPTIDE ANTIGEN AND PREPARATION THEREOF

Knut B. Björklund, Appelviksvägen 26,, 161 36 Bromma, Sweden

Division of Ser. No. 373,004, Jun. 25, 1973, Pat. No. 3,960,827, which is a continuation-in-part of Ser. No. 270,273, Jul. 10, 1972, abandoned. This application Mar. 5, 1976, Ser. No. 664,258

Int. Cl.[2] **A61K** *37/00, 39/00;* **C07G** *7/00;* **G01N** *31/00*

U.S. Cl. 424—12 **6 Claims**

1. A method of making an antigen albumen complex comprising the steps of:

mixing, in acid solution, at a pH not exceeding about 5, the antigen, said antigen being:

a cancer associated polypeptide antigen, obtained from a source selected from the group consisting of human tumor tissue, a culture of cancerous cells grown in vitro, and human placental tissue, having a molecular weight of 23,200 ± 2,500 (S.D.) and showing a spectrophotometric peak absorption at a wave length within the range from about 229 nm to about 233 nm, said polypeptide being based on a single peptide chain as shown by treatment with performic acid, said single peptide chain comprising the following amino acids: Alanine, Arginine, Aspartic acid, Cysteine, Glutamic acid, Glycine, Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Serine, Threonine, Tyrosine, and Valine, said polypeptide antigen comprising also a fluoroescent group which emits fluorescent light at about 350 nm when activated at a wavelength of about 288 nm, and, if not protected by complexing with albumen, denaturating irreversibly at pH's exceeding about 5,

and albumen, and

raising the pH of the solution to about neutral to cause interaction between the components and production of a relatively stable antigen albumen complex.

3. A complex, useful as a stabilized antigen for diagnostic purposes, comprising:

a cancer associated polypeptide antigen, obtained from a source selected from the group consisting of human tumor tissue, a culture of cancerous cells grown in vitro, and human placental tissue, havng a molecular weight of 23,200 ± 2,500 (S.D.) and showing a spectrophotometric peak absorption at a wave length within the range from about 229 nm to about 233 nm, said polypeptide being based on a single peptide chain as shown by treatment with performic acid, said single peptide chain comprising the following amino acids: Alanine, Arginine, Aspartic acid, Cysteine, Glutamic acid, Glycine, Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Serine, Threonine, Tyrosine, and Valine, said polypeptide antigen comprising also a fluoroescent group which emits fluorescent light at about 350 nm when activated at a wavelength of about 288 nm, and if, not protected by complexing with albumen, denaturating irreversibly at pH's exceeding about 5,

and a stabilizing amount of albumen complexed therewith by the method of claim 1.

4,160,019
DETECTION OF CANCER ASSOCIATED POLYPEPTIDE ANTIGEN AND PREPARATION OF ANTIBODIES THERETO

Knut B. Björklund, Appelviksvägen 26, 161 36 Bromma, Sweden

Division of Ser. No. 373,004, Jun. 25, 1973, Pat. No. 3,960,827, which is a continuation-in-part of Ser. No. 270,273, Jul. 10, 1972, abandoned. This application Mar. 5, 1976, Ser. No. 664,285

Int. Cl.[2] **A61K** *37/00, 39/00;* **C07G** *7/00;* **G01N** *31/00*

U.S. Cl. 424—12 **12 Claims**

1. A process for preparing antibodies monospecific with regard to an antigen, said antigen being:

a cancer associated polypeptide antigen, obtained from a source selected from the group consisting of human tumor tissue, a culture of cancerous cells grown in vitro, and human placental tissue, having a molecular weight of 23,200 ± 2,500 (S.D.) and showing a spectrophotometric peak absorption at a wave length within the range from about 229 nm to about 233 nm, said polypeptide being based on a single peptide chain as shown by treatment with performic acid, said single peptide chain comprising the following amino acids: Alanine, Arginine, Aspartic acid, Cysteine, Glutamic acid, Glycine, Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Serine, Threonine, Tyrosine, and Valine, said polypeptide antigen comprising also a fluorescent group which emits fluorescent light at about 350 nm when activated at a wavelength of about 288 nm, and, if not protected by complexing with albumen, denaturating irreversibly at pH's exceeding about 5,

comprising the steps of:

(a) preparing an aqueous solution at a pH less than about 3 of said antigen;

(b) preparing an oil emulsion, wherein the solution result-

ing from step (a) is enclosed phase so as to be protected by the surrounding oil phase;

(c) injecting said oil emulsion into a living animal body, whereby the antigen, carried by the emulsion, is transported to antibody-producing cells.

5. A method of determining the presence of;

a cancer associated polypeptide antigen, obtained from a source selected from the group consisting of human tumor tissue, a culture of cancerous cells grown in vitro, and human placental tissue, having a molecular weight of 23,200 ± 2,500 (S.D.) and showing a spectrophotometric peak absorption at a wave length within the range from about 229 nm to about 233 nm, said polypeptide being based on a single peptide chain as shown by treatment with performic acid, said single peptide chain comprising the following amino acids: Alanine, Arginine, Aspartic acid, Cysteine, Glutamic acid, Glycine, Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Serine, Threonine, Tyrosine, and Valine, said polypeptide antigen comprising also a fluorescent group which emits fluorescent light at about 350 nm when activated at a wavelength of about 288 nm, and, if not protected by complexing with albumen, denaturating irreversibly at pH's exceeding about 5,

by investigating material selected from the group consisting of serum, tissues, secretions and extracts from a living animal body under examination, comprising the steps of:

(a) preparing a series of samples of said material by serial dilution;

(b) adding to each of said samples a predetermined amount of antiserum containing antibodies specific to the antigen;

(c) adding, after incubation, to each of said incubated samples a predetermined amount of the antigen complexed with albumen which is in the form of a particulate carrier labelled therewith;

(d) comparing the resulting series of treated samples with control samples of decreasing known amounts of the albumen-complexed antigen providing inhibition of predetermined amounts of antiserum containing said antibodies, and thereafter adding to each of said control samples a predetermined amount of albumen-complexed antigen, in the form of a particulate carrier labelled therewith; and

(e) establishing, by comparison of sample series and said control samples, the amount of antigen, in the material of said living animal body to indicate the possibility of the presence of cancer and its possible stage of progress.

4,160,020

THERAPEUTIC DEVICE FOR OSMOTICALLY DOSING AT CONTROLLED RATE

Atul D. Ayer, Mt. View, and Felix Theeuwes, Los Altos, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

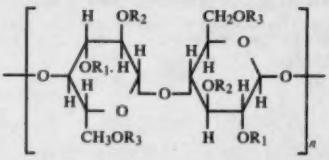
Continuation-in-part of Ser. No. 634,859, Nov. 24, 1975, Pat. No. 4,077,407. This application Dec. 27, 1977, Ser. No. 864,954 The portion of the term of this patent subsequent to Mar. 7, 1995, has been disclaimed.

Int. Cl.[2] **A61M** *31/00;* **A61K** *9/24, 9/44*

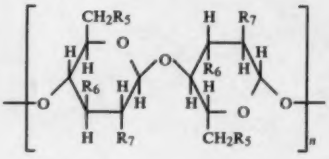
U.S. Cl. 424—15 **10 Claims**

1. An osmotic device for dispensing a drug to an animal comprising:

(a) a shaped wall that is substantially inert and maintains its physical and chemical integrity during the controlled dispensing of the drug, said wall a composition comprising (1) a polymer that is permeable to the passage of an external fluid and substantially impermeable to the passage of drug, said polymer having the following formula:



wherein R_1, R_2 and R_3 are a member selected from the group consisting of hydrogen; alkyl; alkenyl; amino; alkanoyl; alkanoyl substituted with a member selected from the group consisting of alkoxy, halogen, hydroxyl, alkanoyl, carboalkyl, carboalkoxy and cyanoalkoxy; aroyl; aroyl substituted with a member selected from the group consisting of hydroxyl, carboxyl, carboalkyl and cyano; benzyl; carboalkyl; carboxyalkyl; dialkoxyalkyl; dithiocarbonyl; hydroxyalkyl; cyanoalkyl; nitro; phenyl; sulfoalkyl; the alkali metal salts thereof; and wherein said polymer exhibits a degree of substitution at R_1, R_2 and R_3 of greater than 0 up to 3, and n is greater than 5, and (2) a wall forming polymer that is a different polymer than (1) which polymer (2) has the following formula:



wherein R_5, R_6 and R_7 are a member selected from the group consisting of hydroxyl, nitrate; hydroxyalkyl; alkoxy; aryloxy; hydroxyalkoxy; hydroxyalkalkoxy; trityloxy; with at least one of R_5, R_6 and R_7 a member selected from the group consisting of aryloxy; alkanoyloxy; carboxyalkoxy; carbamoyloxyalkoxy; carboxyalkoxyacyloxy; carboxy; carboxybenzoyl; carboxybenzoyloxy; carboxybenzoyloxyalkoxy; and dialkylaminohydroxyalkoxy; the alkali metal salts thereof; and wherein n is greater than 5 up to 3×10^6 and the polymer exhibits a degree of substitution at R_5, R_6 and R_7 of greater than 0 up to 3;

(b) a compartment formed by the shaped wall, said compartment containing a drug formulation selected from the group consisting of locally and systemically acting physiologically and pharmacologically acceptable drugs;

(c) a passageway in the wall communicating with the compartment and the exterior of the device for dispensing drug from the device; and

(d) wherein in operation, when the device is dispensing the drug to the animal, fluid from the environment is imbided through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall, thereby forming a solution containing drug which is dispensed through the passageway at a controlled rate, with the device substantially maintaining its physical and chemical integrity in the presence of the drug and solution thereof during the dispensing period over a prolonged time.

4,160,021
SUBSTITUTED 2H-PYRAN-2,6(3H)-DIONE DERIVATIVES

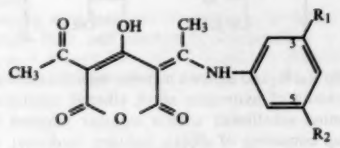
Kenneth M. Snader, Hatboro, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 799,625, May 23, 1977, abandoned. This application Mar. 10, 1978, Ser. No. 885,142

Int. Cl.[2] A61L *9/04;* **A61K** *31/35;* **C07D** *309/16*

U.S. Cl. 424—45 **17 Claims**

1. A compound represented by the formula:



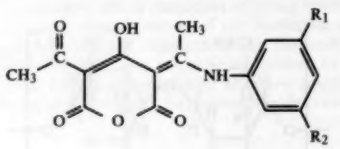
wherein:

R_1 is lower alkoxy oxamoyl, hydroxyoxamoyl, lower alkoxy carbamoyl;

R_2 is lower alkoxy oxamoyl, hydroxyoxamoyl, lower alkoxy carbamoyl, and when R_1 is lower alkoxy carbamoyl, R_2 is also hydrogen, and when R_2 is not hydrogen R_1 and R_2 are the same; and

the lower alkoxy moieties have 1 or 2 carbon atoms, or a mono- or di-alkali metal salt of said compound.

16. A method of inhibiting the symptoms of asthma which comprises administering to an animal in need of said inhibition a therapeutically effective amount for producing said inhibition of a compound represented by the formula:



wherein:

R_1 is lower alkoxy oxamoyl, hydroxyoxamoyl, lower alkoxy carbamoyl;

R_2 is lower alkoxy oxamoyl, hydroxyoxamoyl, lower alkoxy carbamoyl, and when R_1 is lower alkoxy carbamoyl, R_2 is also hydrogen, and when R_2 is not hydrogen R_1 and R_2 are the same; and

the lower alkoxy moieties have 1 or 2 carbon atoms, or a mono-or di-alkali metal salt of said compound.

4,160,022
TOOTHPASTE

Thomas J. Delaney, Piscataway, and William G. Pierson, Flanders, both of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Continuation of Ser. No. 613,397, Sep. 15, 1975, abandoned, which is a division of Ser. No. 419,741, Nov. 28, 1973, Pat. No. 3,937,321, which is a continuation-in-part of Ser. No. 295,094, Oct. 4, 1972, abandoned, and Ser. No. 389,827, Aug. 20, 1973, abandoned. This application Mar. 30, 1978, Ser. No. 891,776

The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.

Int. Cl.[2] A61K *7/18;* **B65D** *85/14, 81/24, 81/26*

U.S. Cl. 424—52 **13 Claims**

1. A dental cream in an unlined aluminum tube having an aqueous vehicle and containing an abrasive content comprising (1) at least about 20% sodium bicarbonate and (2) over 1% of at least one water-insoluble dental abrasive material compatible and which does not tend to form gas on storage with said bicarbonate in the dental cream and said tube which is selected from the group consisting of silica, alumina, calcined alumina, silicates and carbonates non-reactive with the bicarbonate and (3) about 0.01% to 1% fluorine selected from the group of water-soluble fluorine salts consisting of sodium, potassium, ammonium, lithium and amine fluorides; monofluorophosphates salts; complex water-soluble fluorine salts selected from the group consisting of fluorosilicate, fluorozirconate, fluorogermanate and organic fluorides selected from the group consisting of mono-, di- and triethanolamine hydrofluoride and having a bicarbonate to water ratio of about 3:1 to 6:1.

4,160,023
TOXOIDS DERIVED FROM PROTEASE AND ELASTASE OF *PSEUDOMONAS AERUGINOSA* AND PRODUCTION THEREOF

Yuzuru Homma, Tokyo, and Kazuyuki Morihara, Osaka, both of Japan, assignors to Shionogi & Co., Ltd., Japan

Filed Jan. 31, 1977, Ser. No. 764,454

Claims priority, application Japan, Feb. 5, 1976, 51-10836; Feb. 5, 1976, 51-10837

Int. Cl.[2] A61K *39/40, 39/02*

U.S. Cl. 424—87 **22 Claims**

1. Toxoid derived from protease of *Pseudomonas aeruginosa,* which is obtained by inactivating the purified protease by treating purified protease produced from *Pseudomonas aeruginosa* in a suitable buffer solution with 4–10% formalin or 0.04–3M oxymethanesulfinic acid in the presence of lysine, with the subsequent steps of dialysis and lyophilization, said toxoid having the following physicochemical properties:

(1) molecular weight: 63,000 (gel filtration)

(2) ultraviolet absorption spectrum: maximum 280 mμ ($E_{1\%}^{280}$ 9.27 0.1 M KCl), minimum 250 mμ

(3) isoelectric point: pH 5.2 (forcal electrophoresis)

(4) constituent amino acids: (amino acid (g)/100 g of protein) aspartic acid (15.6), glutamic acid (9.5), leucine (8.7), alanine (8.5), glycine (7.7), serine (7.6), tyrosine (6.9), phenylalanine (5.9), theronine (5.0), valine (5.0), lysine (4.1), isoleucine (3.9), arginine (2.3), tryptophan (2.3), proline (2.1), histidine (1.9), ammonia (1.4) (total 98.5 g)

(5) appearance: colorless powder

(6) antigen activity: positive

(7) protease activity: negative.

4,160,024
MAREK'S DISEASE VACCINE

Karel A. Schat, and Bruce W. Calnek, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed May 1, 1978, Ser. No. 901,635

Int. Cl.[2] A61K *39/32*

U.S. Cl. 424—89 **8 Claims**

1. A method of immunizing chickens against Marek's disease without thereby causing tumors in vaccinated chicks comprising the step of inoculating susceptible chicks with a nononcogenic, unattenuated Marek's disease virus vaccine prepared in accordance with a process which comprises the step of serially passing nononcogenic SB strain of Marek's disease virus or a cloned derivative thereof through cell cultures to increase the virus titer to a useful level but without attenuating the original characteristics of the virus.

4,160,025
METHOD OF PRODUCING A BLOOD-COAGULATION-PROMOTING PREPARATION FROM HUMAN BLOOD PLASMA

Johann Eibl; Otto Schwarz, and Fritz Elsinger, all of Vienna, Austria, assignors to Immuno Aktiengesellschaft fur chemisch-medizinische Produkte, Vienna, Austria

Filed Aug. 8, 1977, Ser. No. 822,679

Claims priority, application Austria, Aug. 30, 1976, 6405/76

Int. Cl.[2] A61K *35/16*

U.S. Cl. 424—101 **15 Claims**

1. A method of producing a blood-coagulation promoting preparation having Factor VIII inhibitor bypassing activity

comprising treating plasma containing coagulation Factors II, VII, IX and X in in the absence of free calcium ions with a water-insoluble inorganic coagulation-physiologically-surface-active substance selected from the group consisting of diatomaceous earths and substances composed of silicon dioxide and aluminum oxide to generate the Factor VIII inhibitor bypassing active (FEIBA) substance, said plasma being non-coagulating when treated with said surface-active substance; separating the water-insoluble substances; treating the supernatant with a basic ion exchanger to adsorb the FEIBA substance and said coagulation Factors II, VII, IX and X; eluting the FEIBA substance and the coagulation factors II, VII, IX and X from the basic ion exchanger; and concentrating the FEIBA substance and coagulation Factors II, VII, IX and X.

4,160,026

ANTIBIOTICS SF-1130-X_1 AND -X_2 SUBSTANCES AND PRODUCTION AND USE THEREOF

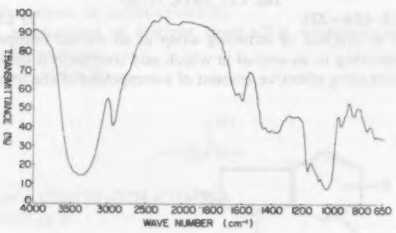
Katsuyoshi Iwamatsu, Kanagawa; Shoji Omoto, Tokyo; Takashi Shomura; Hiroshi Watanabe, both of Yokohama; Michio Kojima, Tokyo; Shigeharu Inoue, Yokohama; Taro Niida, Yokohama; Takashi Hisamatsu, Yokohama, and Shingo Uchida, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Aug. 22, 1977, Ser. No. 826,766

Claims priority, application Japan, Aug. 23, 1976, 51/99757

Int. Cl.[2] C12D *9/14;* A61K *35/74*

U.S. Cl. 424—116 **11 Claims**



1. A process for the production of SF-1130-x_1 substance and SF-1130-x_2 substance, which comprises cultivating a strain of the genus *Streptomyces myxogenes* SF-1130 identifiable as FERM-P. 676 or ATCC 31,305 capable of producing SF-1130-x_1 substance and/or SF-1130-x_2 substance in an aqueous liquid culture medium containing assimilable carbon and nitrogen sources under aerobic conditions for a period of time sufficient to produce and accumulate the SF-1130-x_1 substance, the SF-1130-x_2 substance or both of them in the culture, and then recovering a pure product consisting essentially of at least one of the SF-1130-x_1 substance and SF-1130-x_2 substance from the culture.

4,160,027

STEROID CYANOKETONES AND INTERMEDIATES

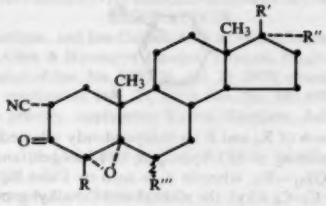
Robert G. Christiansen, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Dec. 20, 1977, Ser. No. 862,417

Int. Cl.[2] A61K *31/58;* C07J *43/00*

U.S. Cl. 424—241 **22 Claims**

1. A compound of the formula



wherein

R is hydrogen or methyl;

R' is hydroxy or lower-alkanoyloxy;

R'' is lower-alkyl, lower-alkenyl or loweralkynyl; or R' and R'' together represent ethylenedioxy;

R''' is hydrogen or methyl; or 3-enol lower-alkanoate esters thereof; with the proviso that when R is hydrogen, R''' is α-methyl; and when R is methyl, R''' is hydrogen or β-methyl.

12. A composition for disrupting pregnancy in a female mammal which comprises an interceptively effective amount of a compound according to claim 1 incorporated in a pharmaceutical carrier suitable for oral administration.

4,160,028

SUBSTITUTED 2-CYCLOPROPYL-CHROMONES AND PHARMACEUTICAL COMPOSITIONS AND USE THEREOF

Gianfederico Doria, Milan; Ciriaco Romeo, Serino; Maria L. Corno; Francesco Lauria, both of Milan; Piero Sberze, Varese, and Marcellino Tibolla, Canale d'Agordo, all of Italy, assignors to Carlo Erba S.p.A., Milan, Italy

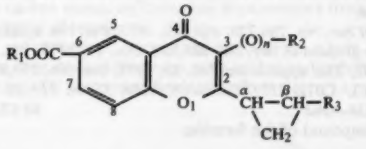
Filed Jul. 3, 1978, Ser. No. 921,853

Claims priority, application Italy, Aug. 2, 1977, 26399 A/77; Jun. 22, 1978, 24824 A/78; Jun. 22, 1978, 24825 A/78; Jun. 30, 1978, 25157 A/78

Int. Cl.[2] A61K *31/35, 31/38, 31/44;* C07D *311/22*

U.S. Cl. 424—248.51 **12 Claims**

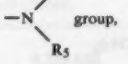
1. A compound of formula (I)



wherein

n is zero or 1;

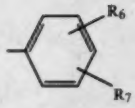
R_1 is hydrogen or C_1–C_{20} alkyl, unsubstituted or substituted by a C_2–C_5 alkanoyloxy or by a



wherein each of R_4 and R_5 is independently selected from the group consisting of hydrogen and C_1–C_{10} alkyl, or R_4 and R_5, taken together with the nitrogen atom, form a N-pyrrolidinyl, piperidino or morpholino radical;

R_2 is C_1–C_8 alkyl or C_3–C_4 alkenyl;

R_3 is (a) furyl, thienyl or pyridyl, the furyl, thienyl and pyridyl grous being unsubstituted or substituted by a methyl group; or (b) the group



wherein each of R_6 and R_7 is independently selected from the group consisting of (a') hydrogen; (b') halogen; and (c') the group $-(O)_{n1}-R_8$, wherein n_1 is zero or 1 and R_8 is C_3–C_4 alkenyl or C_1–C_6 alkyl, the alkenyl and the alkyl groups being unsubstituted or substituted by one or more C_1–C_2 alkoxy or hydroxy groups,
and a pharmaceutically acceptable salt thereof.

9. Trans-6-carboxy-3-propyl-2-[2-(2'-methyl-phenyl)-cyclopropyl]-chromone, as well as the pharmaceutically acceptable salts and the C_1–C_6 alkyl esters thereof.

4,160,029

PROCESS FOR THE PREPARATION OF A WATER-SOLUBLE COMPLEX OF 2-(4'-THIAZOLYL)BENZIMIDAZOLE AND FOR THE PREPARATION OF ANTHELMINTIC FUNGICIDAL COMPOSITIONS

Werner Duyfjes, Bloemendaal, Netherlands, assignor to Merck & Co., Inc., Rahway, N.J.

Filed May 6, 1977, Ser. No. 794,505

Claims priority, application Netherlands, May 10, 1976, 7604976

Int. Cl.[2] C07D *277/20*

U.S. Cl. 424—258 **7 Claims**

1. A water soluble complex of 2-(4'-thiazolyl) benzimidazole with glycolic acid.

2. Anthelmintic and fungicidal composition containing an anthelmintically or fungicidally effective amount of a water-soluble complex of 2-(4'-thiazolyl) benzimidazole with glycolic acid, optionally containing one or more glycolic acid complexes of a pesticidal nitrogen base.

4,160,030

N-OXY AND N-AMINO GUANIDINES

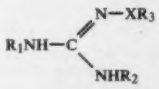
Graham J. Durant; Charon R. Ganellin, and Geoffrey R. Owen, all of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, United Kingdom

Division of Ser. No. 786,729, Apr. 11, 1977, Pat. No. 4,093,729, which is a division of Ser. No. 585,898, Jun. 11, 1975, Pat. No. 4,034,101. This application Feb. 22, 1978, Ser. No. 879,936

Int. Cl.[2] C07D *213/53, 285/08;* A61K *31/44, 31/425*

U.S. Cl. 424—263 **10 Claims**

1. A compound of the formula:



wherein R_1 represents a grouping of the structure shown in the formula:

$$\text{Het} - (CH_2)_m Z (CH_2)_n \qquad \text{FORMULA II}$$

wherein Het is a nitrogen containing 5 or 6 membered heterocyclic ring such as pyridine which is optionally monosubstituted by lower alkyl, hydroxyl, chlorine or bromine, 1,2,4-triazole, 1,3,4-thiadiazole or 2-amino-1,3,4-thiadiazole; Z is sulphur or a methylene group; m is 0, 1 or 2 and n is 2 or 3 provided that the sum of m and n is 3 or 4; R_2 is hydrogen, lower alkyl or a grouping of the structure shown in Formula II wherein Het, m, n and Z are as defined above; X is oxygen or when R_2 is a grouping of the structure shown in Formula II, X may be NH; and R_3 is hydrogen, lower alkyl, phenyl or benzyl, or a pharmaceutically acceptable acid addition salt thereof.

4,160,031

ANTIHISTAMINIC AND APPETITE STIMULATING 10,11-DIHYDRO-3-CARBOXYCYPROHEPTADINE

David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 563,285, Mar. 28, 1975, abandoned, and a continuation-in-part of Ser. No. 522,676, Nov. 11, 1974, abandoned. This application Nov. 22, 1976, Ser. No. 743,562

Int. Cl.[2] A61K *31/445;* C07D *211/34*

U.S. Cl. 424—267 **5 Claims**

1. 10,11-Dihydro-3-carboxycyproheptadine or a nontoxic pharmaceutically acceptable salt thereof.

4. A method of stimulating appetite comprising administering to a patient in need of such treatment an effective appetite stimulating amount of 10,11-dihydro-3-carboxycyproheptadine or a nontoxic pharmaceutically acceptable salt thereof.

5. A method of inducing an antihistaminic effect comprising administering to a patient in need of such treatment an effective antihistaminic amount of 10,11-dihydro-3-carboxycyproheptadine or a nontoxic pharmaceutically acceptable salt thereof.

4,160,032

OXINDOLES AS SLEEP-INDUCERS

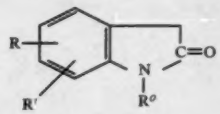
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 417,815, Nov. 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 338,997, Mar. 7, 1973, abandoned. This application Nov. 18, 1974, Ser. No. 525,005

Int. Cl.[2] A61K *31/40*

U.S. Cl. 424—274 **17 Claims**

1. The method of inducing sleep in an animal comprising administering to an animal in which said treatment is desired a sleep-inducing effective amount of a compound of the formula:



wherein
R is halo of atomic weight of from 18 to 36,
R' is hydrogen or halo of atomic weight of from 18 to 36, and
R° is hydrogen or alkyl of 1 to 4 carbon atoms.

4,160,033

METHOD FOR THE CONTROL OF MOSQUITOS BY THE USE OF FILM-FORMING MATERIALS

William D. Garrett, Oxon Hill, and William R. Barger, Camp Springs, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1977, Ser. No. 764,310

Int. Cl.[2] A01N *9/28, 9/24*

U.S. Cl. 424—285 **7 Claims**

1. A method for eradicating mosquitos by applying to a body of water containing immature forms of mosquitos, in an amount sufficient to provide and maintain an approximately monomolecular film of a nonionic, autophobic, organic material with a density less than that of water, a boiling point of 170° C. or higher, a freezing point of less than 5° C., an HLB number of 10 or less, a bulk viscosity of less than 1000 centistokes at the temperature of use, a spreading velocity of 10 cm/sec for the first 100 cm, and a surface tension effectiveness

which lowers the surface tension of said body of water to 30 dynes/cm or less.

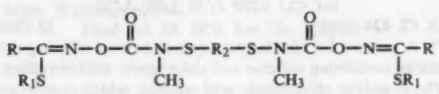
5. The method of claim 1 wherein said material is selected from the class consisting of sorbitan monooleate; a solution of 70 volume percent to less than 100 volume percent of sorbitan monooleate and 2-ethyl butanol; saturated, branched-chain alcohols with a carbon total from 15 to 19 carbon atoms, and one to three oxyethylene groups; unsaturated cis-alcohols with a 15 to 19 carbon atom chain length; unsaturated ethers with a chain length of 12 to 18 carbon atoms and three to five oxyethylene groups; and oleyl ether with two oxyethylene groups and mixtures thereof.

4,160,034
SUBSTITUTED CARBAMATES

Richard F. Sauers, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 812,316, Jul. 1, 1977, abandoned. This application Mar. 10, 1978, Ser. No. 885,251
Int. Cl.² A01N *9/12;* **C07C** *119/18*
U.S. Cl. 424—298 **12 Claims**

1. A compound of the formula

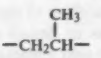


wherein

R is branched or straight chain alkyl containing 1 to 3 carbon atoms or methoxymethyl;

R_1 is branched or straight chain alkyl containing 1 to 3 carbon atoms;

R_2 is $-CH_2CH_2-$,



or $-CH_2CH_2ZCH_2CH_2$; and

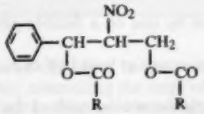
Z is O or S.

4,160,035
PLANT PROTECTING AGENTS AND METHODS FOR THEIR USE

László Lévai; Gyula Mikite, both of Budapest, and Attila Kis-Tamás, Pilisvorosvar, all of Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

Division of Ser. No. 811,901, Jun. 28, 1977. This application Nov. 3, 1977, Ser. No. 848,351
Claims priority, application Hungary, Jul. 6, 1976, EE 2430
Int. Cl.² A01N *9/24*
U.S. Cl. 424—311 **2 Claims**

1. A plant protecting composition with fungicidal, acaricidal, aphicidal and insect antifeedent effects, containing an effective amount of a compound of the formula



(I)

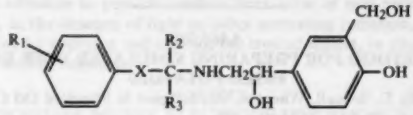
wherein R is a C_{1-20} alkyl group, and a diluent in an amount necessary to make up the final weight of the composition.

4,160,036
4-HYDROXY-1,3-BENZENEDIMETHANOL DERIVATIVES

John Bradshaw, and Ian Collins, both of Ware, England, assignors to Allen & Hanburys Limited, London, England

Continuation of Ser. No. 709,926, Jul. 29, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,658
Claims priority, application United Kingdom, Jul. 29, 1975, 31678/75
Int. Cl.² A01N *9/20, 9/24;* **C07C** *91/22*
U.S. Cl. 424—330 **23 Claims**

1. Compounds of the formula



wherein R_1 represents fluorine, chlorine or dimethylamino, X represents $(CH_2)n$ where n is 2 or 3, R_2 and R_3 are hydrogen or methyl.

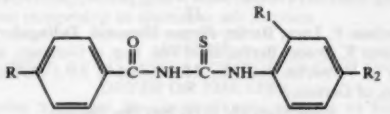
23. A method for the treatment of a patient to relieve bronchospasm which comprises administering an effective amount of a compound as claimed in claim 1.

4,160,037
COMPOUNDS, COMPOSITIONS AND METHODS OF COMBATTING PEST EMPLOYING THIOUREAS

Girts Kaugars, Cooper Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

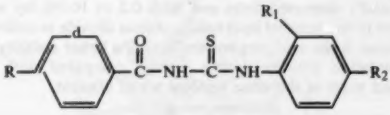
Filed Sep. 30, 1977, Ser. No. 838,165
Int. Cl.² A01N *9/12;* **C07C** *157/07*
U.S. Cl. 424—322 **9 Claims**

1. New 1-aryl-3-benzoyl-2-thioureas of the formula



wherein R is hydrogen; and R_1 is lower alkyl of from one to four carbon atoms, inclusive and R_2 is selected from the group consisting of bromo and chloro.

7. A method of controlling insect pests which comprises contacting susceptible insect pests with a pesticidally effective amount of a compound having the formula



wherein R is hydrogen; and R_1 is lower alkyl of from one to four carbon atoms, inclusive, and R_2 is selected from the group consisting of bromo and chloro.

4,160,038
LACTIC ACID FERMENTATE FLAVORED PET FOOD

Richard L. Groben; Alfred J. Gryczka, and Alfred A. Franklin, all of Sarasota, Fla., assignors to Microlife Technics, Inc., Sarasota, Fla.

Filed Aug. 9, 1976, Ser. No. 712,492
Int. Cl.² A23K *1/10, 1/00*
U.S. Cl. 426—53 **10 Claims**

1. A semi moist pet food composition for carnivorous lower animals comprising a deformable shape retaining hydrated

matrix of meaty protein and vegetable protein with a moisture content between about 15 and 30% by weight which matrix is in admixture with bacteriostatic low molecular weight solids and an effective level of an antimycotic agent to prevent mold formation said composition packagable under non-sterile conditions and further comprising a flavoring from an edible material fermentate of lactic acid producing bacteria in an amount sufficient to produce a pH from about 3 to less than 6 which flavored food is palatable to dogs and flavor stable, wherein the edible material fermentate is prepared by growing the bacteria in the presence of a meaty protein, vegetable protein or mixture thereof until the pH from lactic acid and the flavoring is produced.

4,160,039

METHOD FOR PREPARING SIMULATED DEEP FAT FRIED POTATOES

Philip G. Schnell, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 19, 1977, Ser. No. 825,863

Int. Cl.[2] A23L *1/216*

U.S. Cl. 426—60 **11 Claims**

1. A method for preparing simulated french fried potatoes comprising:

(a) forming a blend comprising from about 2 to about 10 weight percent inactive dried yeast, from about 50 to about 100 parts by weight vegetable oil, and from about 0 to about 50 parts by weight water;

(b) emulsifying the blend;

(c) coating the raw french fries with the emulsified blend; and

(d) baking the coated french fries at from about 375 to about 450° F. for from about 5 to about 20 minutes.

4,160,040

FREELY-FLOWING POWDERED FRESH BAKER'S YEAST PREPARATION AND METHOD OF PRODUCING IT

Sebastiano F. Luca, Berlin; Jürgen Thommel, Delingsdorf, and Walter K. Bronn, Berlin, all of Fed. Rep. of Germany, assignors to Versuchsanstalt der Hefeindustrie e.V., Berlin, Fed. Rep. of Germany

Filed Mar. 28, 1977, Ser. No. 782,256

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1976, 2614348

Int. Cl.[2] C12C *11/26, 11/18*

U.S. Cl. 426—62 **2 Claims**

1. A free-flowing powdery baker's yeast preparation which consists of a mixture of finely dispersed yeast, having a residual water content of 65 to 75% by weight with 0.01 to 5.0% by weight related to the yeast of hydrophobic silion dioxide in colloidally dispersed form and with 0.2 to 10.0% by weight related to the yeast of hydrophilic silicon dioxide in colloidally dispersed form, said preparation having a better stability of its fermentation activity during storage compared with compressed yeast of the same residual water content.

4,160,041

METHOD OF PREPARING A SOLID ANIMAL FEED SUPPLEMENT

Jack J. Schroeder, Rollings Hills, and James W. Sawhill, Canoga Park, both of Calif., assignors to Jack J. Schroeder, Long Beach, Calif.

Filed Feb. 14, 1977, Ser. No. 768,324

Int. Cl.[2] A23K *1/22*

U.S. Cl. 426—69 **18 Claims**

1. The method of preparing a solid animal feed supplement block product which comprises the steps of:

(a) admixing at least about 0.5 weight percent based on the supplement product of a metal oxide selected from the class consisting of magnesium oxide, aluminum oxide, calcium oxide and mixtures thereof with an aqueous sugar solution containing from 10 to about 90 weight percent sugar;

(b) hydrating said metal oxide to provide a sugar solution with soluble metal ions having a pH value from 9 to about 11;

(c) thereafter reacting said solution with a monoalkali metal or ammonium orthophosphate or phosphoric acid at a concentration, expressed as P_2O_5, from 2 to about 5 weight percent based on the supplement product sufficient to react with said soluble metal ions and produce a product having a pH value from 3 to about 6, the amounts of said phosphate additive and metal ions being sufficient to solidify said supplement into a solid block; and

(d) recovering a solid feed supplement block product.

4,160,042

PROCESS FOR TREATING AN AQUEOUS EXTRACT OF A VEGETABLE MATERIAL

David R. Farr, Brent, and Ian Horman, Corseaux, both of Switzerland

Filed Oct. 17, 1977, Ser. No. 842,987

Claims priority, application Switzerland, Jul. 29, 1977, 9410/77

Int. Cl.[2] A23F *1/10, 1/09, 3/00*

U.S. Cl. 426—387 **22 Claims**

1. A process for treating an aqueous extract of a vegetable material containing caffeine and chlorogenic acid to reduce its caffeine and/or chlorogenic acid content, which comprises:

(a) contacting said aqueous extract with a solid ligneous adsorbent of vegetable origin in divided form at a temperature of from 0° to 100° C;

(b) separating said adsorbent from said aqueous extract;

(c) washing said adsorbent with water at a temperature of from 0° to 30° C. so as to displace non-specifically associated soluble constituents and combining washing waters with said aqueous extract;

(d) subjecting said adsorbent to lixiviation with hot water at at least 60° C. so as to desorb caffeine and chlorogenic acid and regenerate said adsorbent; and

(e) contacting regenerated adsorbent with said aqueous extract and repeating the preceding cycle until a desired preselected decaffeination and/or deacidification level is obtained.

4,160,043

METHOD OF MAKING TACO SHELLS

Daniel T. Stickle, deceased, late of Dallas, Tex., and Hortencia M. Stickle, executrix, 4332 Mill Creek Rd., Dallas, Tex. 75234

Continuation of Ser. No. 390,164, Aug. 20, 1973, Pat. No. 3,928,638, which is a division of Ser. No. 222,493, Feb. 1, 1972, Pat. No. 3,785,273. This application Jan. 13, 1975, Ser. No. 540,709

The portion of the term of this patent subsequent to Dec. 12, 1972, has been disclaimed.

Int. Cl.[2] A21D *10/00*

U.S. Cl. 426—439 **8 Claims**

1. The method of forming and frying a crisp, edible product comprising:

placing tortillas one by one on a flexible pliable elongated web,

placing a plunger to cover at least half of each of the tortillas,

folding the web lengthwise over each of the plungers,

pushing the folded web, plunger and tortilla through a vat of hot grease, thus

frying the tortilla into a crisp, edible product.

4,160,044

PREPARATION OF PROCESSED CHEESES CONTAINING NUTMEATS

Rutilio Invernizzi, Milan, and Giovanni Prella, Vercelli, both of Italy, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Mar. 26, 1975, Ser. No. 562,002

Claims priority, application Switzerland, Apr. 1, 1974, 4490/74

Int. Cl.[2] A23C *19/12*

U.S. Cl. 426—582 4 Claims

1. A process for the production of processed cheeses containing walnuts, wherein the walnuts are contacted with three successive immersions of demineralized water free from iron salts and salts of heavy metals having cations capable of reacting with tannin and tannic acids to form substantially insoluble tannates for periods of time of 14–16 hours, 4 hours and 4 hours, respectively, to remove tannin from the walnuts and thereafter are combined with a mass of processed cheese.

4,160,045

METHOD FOR PRODUCING A SCABROUS PHOTOSENSITIVE SURFACE

Randolph E. Longshore, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 25, 1978, Ser. No. 928,033

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—38 3 Claims

1. A method for producing, in a vacuum, a scabrous finish on a surface, including the steps of:

depositing on said surface small islands of a protective material; and

bombarding said surface and said islands with charged particles to remove said islands and the surface between said islands by sputtering.

4,160,046

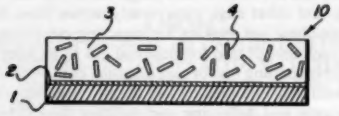
METHOD OF MAKING AN IMAGING SYSTEM

Koji Okumura, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 663,182, Mar. 2, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,579

Int. Cl.[2] B05D *3/12*

U.S. Cl. 427—57 7 Claims



1. A method of making a binder configuration orientation imaging member comprising the steps of:

(a) providing a softened electrically insulating material which has a viscosity of at least about 10^5 poise at 70° C.;

(b) adding photosensitive electret particles to said softened material in a weight ratio of at least 1:1; and

(c) forming a layer of combined materials and allowing them to rigidify sufficiently to resist orientation of said electrets while a continuous vibration is being applied thereto to provide random orientation of said particles.

5. In a method for improving image contrast while utilizing an imaging device comprising a base or substrate, and an electrically insulating matrix layer containing dispersed electret imaging particles, the improvement comprising initially coating the electret particles with a photoconductive material and dispersing the resulting treated particles into a softenable insulating organic binder as matrix in a ratio by weight of particles-to-matrix of at least 1:1, the initial dispersion being effected into the softened or liquified matrix in the presence of continuous vibration to provide random orientation of said particles and, in the absence of light or other activating radiation, followed by applying and cooling the treated matrix, in situ, on the base or substrate.

4,160,047

POSITIVE NICKEL ELECTRODE FOR ALKALINE STORAGE BATTERIES AND PROCESS FOR ITS PRODUCTION

Nikolaus Saridakis, Brunswick, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 919,829

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731064

Int. Cl.[2] B05D *5/12*

U.S. Cl. 427—115 14 Claims

1. In a process for the production of a positive nickel electrode for alkaline storage batteries wherein a porous supporting grid of conducting material is immersed in an impregnating solution containing a nickel salt dissolved in a solvent, and said grid is subsequently immersed in an alkaline medium for precipitating out hydroxides, the improvement wherein said impregnating solution contains a least one aluminum salt in solution and wherein prior to impregnation with the impregnating solution, the supporting grid is immersed in a pre-impregnating solution comprising an aluminum salt solution.

4,160,048

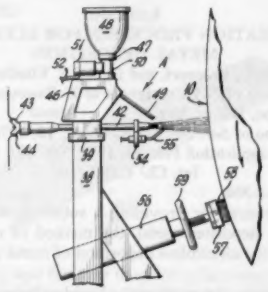
METHOD OF MAKING A COMPOSITE CAST IRON DRYER OR THE LIKE

Frederick T. Jaeger, Rosemere, Canada, assignor to Eutectic Corporation, Flushing, N.Y.

Continuation of Ser. No. 752,739, Dec. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 728,077, Sep. 30, 1976, Pat. No. 4,064,608. This application May 24, 1978, Ser. No. 909,169

Int. Cl.[2] B23P *7/00;* B05D *1/08*

U.S. Cl. 427—142 13 Claims



1. The method of using a gas torch in the spray-coating of a convex cylindrical metal workpiece surface, which comprises rotating the workpiece on a horizontal axis, orienting the torch for discharge generally horizontally and radially toward the cylindrical surface at a given longitudinal location and at a first general peripheral location, adding a flow of metal powder to the torch flow, whereby a coating of metal is locally deposited on the workpiece surface in the course of workpiece rotation,

concurrently abrasively scouring the cylindrical surface at said longitudinal location and at a second general peripheral location angularly offset from the region of instantaneous torch discharge, the direction of workpiece rotation being such that the cylindrical surface moves downward past the region of torch discharge thereon, and horizontally traversing along the workpiece the longitudinal region of torch discharge and abrasive scouring, the effective longitudinal extent of the region of torch discharge and abrasive scouring being relatively great compared to the traverse advance per workpiece revolution, whereby multiple coats of sprayed metal are applied to the workpiece for a given traverse, and whereby in the course of said given traverse the abrasive scouring step is performed after application of each coat and before application of the next coat, to thereby remove metal powder which is not densely compacted and fused between coat applications so that more densely compacted sprayed metal will characterize the coat produced in the course of continuous rotation of the workpiece.

4,160,049
BRIGHT ELECTROLESS PLATING PROCESS PRODUCING TWO-LAYER NICKEL COATINGS ON DIELECTRIC SUBSTRATES

Harold Narcus, 15 Vesper St., Worcester, Mass. 01602

Filed Nov. 7, 1977, Ser. No. 849,165
Int. Cl.[2] C23C *3/02*
U.S. Cl. 427—277 **11 Claims**

1. Method of producing adherent, decorative, two-layer nickel coatings on dielectric substrates comprising,

activating the substrate surface,

electrolessly depositing a first dull nickel alloy layer thereon comprising 6–12% phosphorus, balance essentially nickel, in a first electroless coating bath, the layer being dense and levelled,

and subsequently producing a second nickel-phosphorus alloy layer of self building brightness over the first layer by electroless coating in a second, different electroless coating bath,

the second bath also producing a 6–12% phosphorus, balance essentially nickel, composition,

and wherein the coating rates in both the first and second baths are controlled to be 0.0006″–0.0008″ per hour with the first layer coating step being long enough to produce an adherent 0.000010″–0.00015″ thickness (i.e., 2500–37,500 Angstroms) first layer and the second layer coating being carried out long enough to produce a second coating layer which is even thicker than the first coating layer.

4,160,050
CATALYZATION PROCESSES FOR ELECTROLESS METAL DEPOSITION

Francis J. Nuzzi, Freeport, and Daniel F. Vitellaro, Huntington Station, both of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation of Ser. No. 676,527, Apr. 13, 1976, abandoned. This application Feb. 18, 1977, Ser. No. 770,063
Int. Cl.[2] C23C *3/02*
U.S. Cl. 427—304 **16 Claims**

1. In a process for providing a substrate with a layer of electrolessly deposited metal, the method of catalyzing said substrate to the electroless deposition of metal comprising the steps:

(a) contacting the portion(s) of said substrate to be metallized with a liquid seeder comprising the admixture of:

(1) a source of cuprous ions;

(2) a reducing agent capable of reducing cupric ions to cuprous ions, but incapable of reducing cuprous ions to elemental copper in the environment of said admixture;

(3) a source of hydrogen ions;

(4) a source of halogen ions; and

(5) at least one organic solvent for said source of cuprous ions, said solvent being present in at least an amount sufficient to solubilize said source of cuprous ions; and

(b) without drying, treating said portion(s) of said substrate contacted with said admixture with water.

4,160,051
ZIRCONIUM FLAME-RESIST TREATMENT

Ladislav Benisek, Ilkley, England, assignor to I.W.S. Nominee Company Limited, London, England

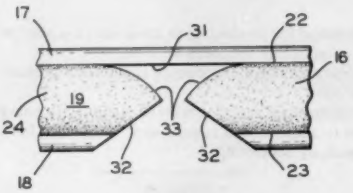
Continuation of Ser. No. 235,866, Mar. 17, 1972, abandoned. This application Jul. 9, 1976, Ser. No. 703,912
Int. Cl.[2] D06M *13/50*
U.S. Cl. 427—352 **8 Claims**

1. A process for improving the flame resist properties of natural and synthetic polyamide fibers which comprises applying to scoured natural or synthetic polyamide fibers having a residual methylene chloride extract of not more than 0.8% an aqueous solution containing an anionic zirconium complex ion selected from the group consisting of a fluorozirconate and a complex of zirconium with an organic chelating agent, said solution having a pH in the range of 0.5 to 4.0, whereby to impregnate the substance of said fibers with said anionic zirconium complex and thereafter drying said fibers, the proportion of said zirconium complex in relation to said fibers being sufficient to satisfy at least the minimum requirements of the Vertical Flame Test—A.A.T.C. Test Method 34-1969, Fire Resistance of Textile Fabrics.

4,160,052
CORNER FOR DECORATIVE AND PROTECTIVE MOLDING STRIP

Brian T. Krysiak, North Royalton; James M. Kunevicius, Richfield, and Bruce C. Leslie, Garfield Heights, all of Ohio, assignors to Lof Plastics Inc., Detroit, Mich.

Filed Aug. 15, 1977, Ser. No. 824,410
Int. Cl.[2] B60R *13/02, 13/04*
U.S. Cl. 428—31 **17 Claims**



1. In a method of forming a corner in an elongated decorative and protective molding strip for application to a supporting surface, the improvement comprising the steps of making a longitudinal cut through said strip spaced inwardly from and parallel to one side edge of said strip forming a continuous side portion therealong, making diagonal cuts partially across said strip from the other side edge in the form of a V with its apex midway between the ends of said longitudinal cut and its sides intersecting said other edge transversely across from the ends of said longitudinal cut, making a connecting cut through said strip from each end of said longitudinal cut to an intersection with the corresponding one of said diagonal cuts, removing the portion of said strip bounded by said longitudinal, diagonal and connecting cuts, and deflecting said molding strip to bring the edge walls formed by said diagonal cuts and the edge walls formed by said connecting and longitudinal cuts into abutting relationship, with said side portion forming a continuous band around the exterior of said corner.

10. In a decorative and protective molding strip for mounting upon a supporting surface along a predetermined path, the improvement comprising a continuous elongated resilient member having portions removed at a selected location there-

along forming a corner portion to permit mounting of said continuous strip to follow said path, said removed portions including a V-shaped notch extending inwardly from one side edge of said strip and generally triangular portions spaced from the other side edge and contiguous with said V-shaped notch.

4,160,053

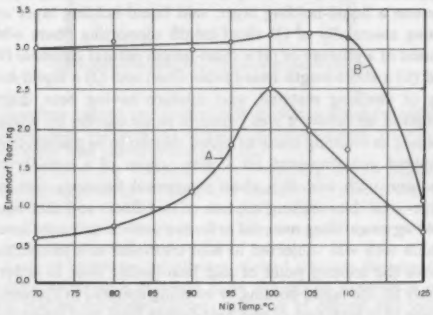
BLOCKED FILM LAMINATE OF LOW DENSITY POLYETHYLENE

William J. Clayton, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 651,675, Jan. 23, 1976, abandoned. This application Nov. 17, 1977, Ser. No. 852,407

Int. Cl.[2] B65D *31/00*

U.S. Cl. 428—35 **6 Claims**



1. A laminate of at least two low density polyethylene films blocked together at a temperature between about 80° C. and 100° C. and below the fusion temperature of the polyethyiene.

4,160,054

PLAQUE INHIBITING COMPOSITION AND METHOD

Austin C. Wagenknecht, deceased, late of Golden Valley, Minn. (by Don A. Wagenknecht, personal representative); George V. Daravingas, Edina, and William E. Koski, Minneapolis, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Nov. 28, 1977, Ser. No. 855,535

Int. Cl.[2] A61K *9/68*

U.S. Cl. 424—48 **9 Claims**

1. A chewing gum comprising:
(a) from about 0.001% to about 15% by weight of an alkyl sulfate salt;
(b) from about 0.001% to about 15% by weight of a stearoyl-2-lactylate salt;
(c) from about 0.001% to about 5% by weight of a zinc compound;
(d) from about 0.05% to about 10% by weight of a plaque inhibiting flavor selected from the group consisting of cinnamon oil, peppermint oil, and spearmint oil and mixtures thereof; and,
(e) from about 10% to about 95% by weight of a gum base.

4,160,055

CONTROLLED POROSITY OF UNCURED REINFORCED THERMO-SETTING PLASTIC MATERIAL

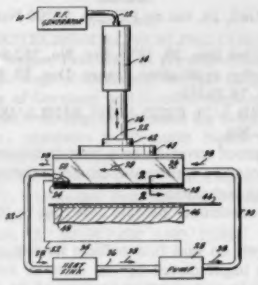
Clyde H. Reed, Riverside, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Division of Ser. No. 846,457, Oct. 28, 1977, Pat. No. 4,132,519. This application Jul. 17, 1978, Ser. No. 925,118

Int. Cl.[2] B29F *5/00;* **B29D** *7/20*

U.S. Cl. 428—131 **3 Claims**

1. A process for penetrating a sheet of uncured reinforced thermosetting plastics material and locally curing to "3" stage said material adjacent resulting perforations in said material, comprising: penetrating through a sheet of said uncured thermosetting material with a plurality of sharpened pins, vibrating said pins within said material at sonic frequency and maintaining said vibrating within said material for a sufficient length of time for said thermosetting material to cure to "B" stage in limited areas only adjacent said pins.



4,160,056

STEEL SHEET FOR DrD CANS AND DI CANS

Tadashi Tanaka, Yokohama; Tatsuro Obi, Tokyo; Nobuichi Arai, Sagamihara, and Teruo Koyama, Yokohama, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 16, 1977, Ser. No. 834,005

Claims priority, application Japan, Sep. 20, 1976, 51-112577

Int. Cl.[2] B65D *65/42, 7/42;* **B32B** *15/08*

U.S. Cl. 428—220 **2 Claims**

1. A steel sheet for production of DrD or DI cans comprising a cold rolled steel sheet, a solvent type thermo-setting paint baked on the steel sheet in a completely cured state, said paint containing 1 to 30% ethylene-vinyl acetate copolymer on the basis of the solid substance of the paint and having a thickness of 3 to 15 μm in a dried state.

4,160,057

SPLIT RESISTANT STRAPPING TAPE

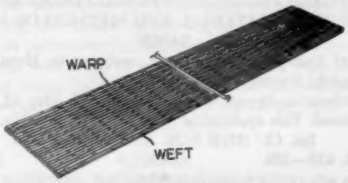
Calvert S. Kogan, Westmount, and Marty Kogan, Pointe Claire, both of Canada, assignors to Plastic Monofil Co. Ltd., Colchester, Vt.

Continuation-in-part of Ser. No. 687,500, May 18, 1976, abandoned. This application Nov. 29, 1977, Ser. No. 855,656

Claims priority, application Canada, May 21, 1975, 227402

Int. Cl.[2] D03D *15/00*

U.S. Cl. 428—245 **21 Claims**



1. A strapping tape resistant to splitting in a transverse direction and having high strength, wherein said strapping tape has:
a width of about ¼ inch to about 1½ inches,
about 22 to about 52 warp elements per inch wherein each of said warp elements has a denier of about 840 to about 3000 and the total denier of all warp elements does not exceed about 73,000 denier/in, and
1 to 5 weft elements per inch wherein each of said weft elements has a denier of about 50 to about 1000.

4,160,058

WATERPROOF COVERING DEVICE, ESPECIALLY FOR TERRACES, AND METHOD FOR MANUFACTURING SAME

Jean-Yves K-Gall, 26, rue de 1'Eglise, 92200 Neuilly-sur-Seine, France

Filed Dec. 20, 1976, Ser. No. 752,547

Claims priority, application France, Dec. 23, 1975, 75 39578; Aug. 30, 1976, 76 26166

Int. Cl.[2] **B23B** *3/26;* **E02D** *27/00;* **B32B** *5/18;* **D04H** *1/00*

U.S. Cl. 428—286 **31 Claims**

1. A waterproof covering on a base or support, including a base or support and a waterproof covering thereon, said waterproof covering comprising:

a first thin continuous pellicle adhering to the base or support;

a textile layer on said first pellicle having a portion of its thickness impregnated by the material constituting said first pellicle and another portion of its thickness non-impregnated thereby; and

on the face of said textile layer opposite to the face coming in contact with said first pellicle, a second continuous watertight pellicle impregnated into said textile layer a distance sufficiently thin to leave a portion of the thickness of the textile layer non-impregnated by both the material constituting said first pellicle and the material constituting said second pellicle, said non-impregnated portion of the textile layer being sufficiently thick to preserve the external pellicle from excessive mechanical stress in case of cracking of the base or support.

20. A process for manufacturing a waterproof covering on a basis or support comprising:

depositing a first fluid, film-forming product onto the surface of the basis or support to be waterproofed, said film-forming product being one in which the formed film is adhering and continuous;

before said first film-forming product completes film formation, while a portion thereof is still in the fluid state, laying a textile layer onto said first film-forming product in such a way that a portion of said textile layer becomes impregnated with said first product but the central portion of said textile layer does not become impregnated with said first product; and

depositing a second fluid, film-forming product onto said textile layer in such a way that a portion of said textile layer opposite that portion impregnated with said first product becomes impregnated with said second product but the central portion of said textile layer is not impregnated, said second film-forming product being one in which the formed film is an elastic waterproof film.

4,160,059

ADSORPTIVE NONWOVEN FABRIC COMPRISING FUSED FIBERS, NON-FUSED FIBERS AND ABSORPTIVE MATERIAL AND METHOD OF MAKING SAME

Tadanori Samejima, Fuji, Japan, assignor to Honshu Seishi Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 685,687, May 12, 1976, abandoned. This application May 24, 1978, Ser. No. 908,922

Int. Cl.[2] **B32B** *5/26, 5/30, 23/10, 31/26*

U.S. Cl. 428—288 **28 Claims**

1. An adsorptive nonwoven fabric web comprising a support consisting of a thin sheet of paper or the like having superposed thereon an adsorptive layer, said adsorptive layer consisting essentially of (1) short-length supporting fibers which consist of a mixture of (a) a short-length natural cellulose main supporting fiber and (b) a short-length heat-fusible fiber; and (2) a powdered adsorptive material, said mixture having been disintegrated in air before it was joined in an air current by said adsorptive material added thereto to be pneumatically admixed and dispersed on a wire screen of a web-forming machine with said thin sheet interposed between said wire screen and the resulting mixture of said fibers and said adsorptive material to form a web on said wire screen, which web was subjected to heat treatment at a temperature above the melting point of said heat-fusible fiber in order to firmly fix the adsorptive material and the main supporting fiber in the web by fusion of at least part of said heat-fusible fiber, said adsorptive material being fixed to said heat-fusible fiber substantially only at points of contact between said heat-fusible fiber and adsorptive material such that all but a very small part of the surface area of the adsorptive material remains exposed, and said main supporting fiber being fixed in the web substantially only at points of contact between said heat-fusible fiber and said main supporting fiber such that all but a very small part of the surface area of said main supporting fiber remains exposed.

8. A liquid-holding nonwoven fabric web comprising a support consisting of a thin paper of the like having superposed thereon a liquid-holding layer, said liquid-holding layer consisting essentially of (1) short-length supporting fibers which consist of a mixture of (a) a short-length natural cellulose fiber and (b) a short-length heat-fusible fiber; and (2) a liquid-holding or swelling material, said mixture having been disintegrated in air before it was joined in an air current by a liquid-holding or swelling material added thereto to be pneumatically admixed and dispersed on a wire screen of a web-forming machine with said thin sheet interposed between said wire screen and the resulting mixture of said fibers and said liquid-holding or swelling material to form a web on said wire screen, which web was subjected to heat treatment at a temperature above the melting point of said heat-fusible fiber in order to firmly fix the liquid-holding or swelling material in the web by fusion of at least part of said heat-fusible fiber, said liquid-holding or swelling material being fixed to said heat-fusible fiber substantially only at points of contact between said heat-fusible fiber and liquid-holding or swelling material such that all but a very small part of the surface area of the liquid-holding or swelling material remains exposed, and said main supporting fiber being fixed in the web substantially only at points of contact between said heat-fusible fiber and said main supporting fiber such that all but a very small part of the surface area of said main supporting fiber remains exposed.

15. A method of making an adsorptive nonwoven fabric web which comprises the steps of:

shredding a natural short-length cellulose fiber in air;

adding a short length heat-fusible fiber to said cellulose fiber to form a mixture;

feeding said mixture to a disintegrator to form disintegrated short-length supporting fibers;

adding a powdered adsorptive material to said disintegrated short-length supporting fibers;

pneumatically conveying said mixture containing said adsorptive material to a wire screen of a web-forming machine where it is formed into a web;

applying a thin sheet of paper or the like between said mixture containing said adsorptive material and said wire screen of said web-making machine;

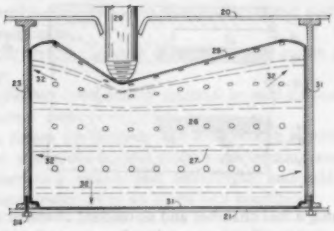
applying heat to said mixture containing said adsorptive material to bring the temperature thereof above the melting point of said heat-fusible fibers to fix said adsorptive material in the web by heat fusion via said heat-fusible fibers, resulting in said adsorptive material being fixed to said heat-fusible fiber substantially only at points of contact between said heat-fusible fiber and adsorptive material such that all but a very small part of the surface area of the adsorptive material remains exposed, and said main supporting fiber being fixed in the web substantially only at points of contact between said heat-fusible fiber and said main supporting fiber such that all but a very small part of the surface area of said main supporting fiber remains exposed.

4,160,060

PLATFORM SAFETY BARRIER

Douglas Bynum, Jr., Spring, Tex., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jan. 23, 1978, Ser. No. 871,295
Int. Cl.[2] B32B *3/26*
U.S. Cl. 428—310 17 Claims



1. A safety barrier to prevent falling objects from penetrating horizontal surfaces of offshore structures and entering space below said surfaces comprising,

(a) A penetration resistant layer overlying (b) an impact absorbing material of sufficient thickness to absorb anticipated impact energy, disposed (c) beneath said horizontal surface of said structure, and (d) over said space to be protected beneath said surface.

5. A safety barrier as described in claim 1 wherein the impact absorbing material is selected from the group consisting of natural rubber, synthetic rubber, mixtures of natural and synthetic rubber, or foamed thermoplastic materials.

6. A safety barrier as described in claim 5 wherein the impact absorbing material is a foamed thermoplastic selected from the group consisting of polystyrene foams or polyurethane foams.

4,160,061

HEAT-REFLECTING GLASS PLATE AND METHOD OF PRODUCING SAME

Seiki Okino, Matsusaka; Takao Mori, Ise; Toshiharu Yanai, Matsusaka, and Toshikazu Sawa, Mie, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Continuation of Ser. No. 671,550, Mar. 29, 1976, abandoned. This application Aug. 19, 1977, Ser. No. 826,126
Claims priority, application Japan, Mar. 29, 1975, 50-38144
Int. Cl.[2] B05B *5/06, 3/02;* B32B *17/06*
U.S. Cl. 428—334 4 Claims

1. In a heat-reflecting glass plate having a metal oxide film coated on one side of the glass plate, said metal oxide film comprising the oxides of chromium, cobalt, and iron, and having a thickness ranging from about 30 to 80 millimicrons, the improvement wherein the metal oxide film, in addition to said oxides, contains aluminum oxide, the aluminum being present in an amount of from 5 to 35% by weight of the total metals contained therein, whereby a lowering of the reflectivity of the heat-reflecting glass plate for solar energy resulting from subsequent heat treatment to temper or bend the heat-reflecting glass plate is suppressed.

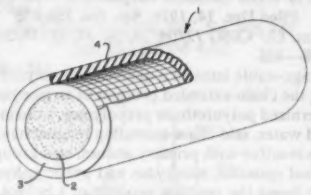
3. In a method of producing a heat-reflecting glass plate having a metal oxide coating on one side of the glass plate comprising coating one side of the glass plate with a solution containing acetyl acetonates of chromium, cobalt, and iron dissolved in an organic solvent, heating the coated glass plate to a temperature between from about 400° to the softening point of the glass plate, thereby causing the acetyl acetonates to decompose to form a film having a thickness ranging from about 30 to about 80 millimicrons and forming oxides of chromium, cobalt, and iron, the improvement comprising: adding aluminum acetyl acetonate to the solution in such a quantity that the metal oxide film consists essentially of oxides of aluminum, chromium, cobalt, and iron, with the aluminum being present in an amount of from 5 to 35% by weight of the total metals, so as to suppress the lowering of the reflectivity of the glass plate resulting from subsequent heat treatment of the glass plate for tempering or bending thereof.

4,160,062

PYROTECHNICAL SEALING CORD

Heinz Gawlick, Vagen, Fed. Rep. of Germany; Axel Homburg, Troisdorf, Fed. Rep. of Germany; Werner Siegelin, Nuremberg, Fed. Rep. of Germany, and Gunther Marondel, deceased, late of Erlangen, Fed. Rep. of Germany (by Gisela M. Marondel, executrix), assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 29, 1976, Ser. No. 671,062
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1975, 2513568; Apr. 18, 1975, 2517323
Int. Cl.[2] B32B *1/04, 3/02, 33/00*
U.S. Cl. 428—365 11 Claims



1. A pyrotechnical sealing material wherein a heat-foamable synthetic resin is foamed with the aid of heat generated from a burnable pyrotechnical composition that is capable of being burned without the evolution of gas, said sealing material being in the form of a cord, said cord having a core comprising the pyrotechnical composition and a casing separated from the core by a flexible sheath formed of metal or a synthetic resin thread, said metal not being a low melting or readily oxidizable metal and, said casing comprising the heat-foamable synthetic resin.

4,160,063

METHOD FOR PREVENTING THE ADHERENCE OF OIL TO SURFACES

Paul E. Titus, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 614,093, Sep. 17, 1975, Pat. No. 4,039,717, which is a division of Ser. No. 416,712, Nov. 16, 1973, abandoned. This application May 12, 1977, Ser. No. 796,271
Int. Cl.[2] B32B *15/04*
U.S. Cl. 428—389 4 Claims

1. A method for reducing the adherence of viscous crude oil to sucker rods in oil wells wherein the high-viscosity of the crude oil limits production by reducing the speed of sucker rod descent during each stroke comprising coating the sucker rods with a film of carboxymethylcellulose cross-linked in the presence of water with a salt of a polyvalent metal, whereby the film tends to reduce failing of the sucker rods and increase the speed of descent during each stroke of the sucker rods.

4,160,064

EPOXY ADHESIVE SEALANT

Edward A. Nodiff, Philadelphia, Pa., assignor to Theodore R. Flint, Valley Forge, Pa.

Filed Jun. 15, 1977, Ser. No. 806,279
Int. Cl.[2] B32B *27/38;* D06P *3/00, 5/00*
U.S. Cl. 428—413 15 Claims

1. In a putty-like epoxy adhesive sealant comprising a first band of an uncured epoxy resin composition and a second band, said second band comprising a composition capable of curing of said epoxy resin when said first and second bands are combined to form a substantially uniform mixture, the improvement wherein said uncured epoxy resin composition

contains from about 0.02 to about 5%, by weight, of a coloring agent effective to impart latently transient color to said epoxy resin composition which contrasts with the color of said curing composition, said colored epoxy resin composition forming a substantially uniformly colored composition when said epoxy resin composition and said curing composition are combined to form a substantially uniform mixture, said uniformly colored composition becoming essentially colorless with curing of said epoxy resin composition.

4,160,065

POLYURETHANE LATEXES FROM NCO PREPOLYMERS CHAIN EXTENDED WITH POLYEPOXIDES, POLYANHYDRIDES OR POLYALDEHYDES, AND LAYERED PRODUCTS

Peter Loewrigkeit, Wyckoff; Kenneth A. Van Dyk, Franklin Lakes, and Thomas T. McGimpsey, Newark, all of N.J., assignors to Witco Chemical Corporation, New York, N.Y.

Filed Dec. 14, 1976, Ser. No. 750,476

Int. Cl.[2] C08G *12/06, 18/34, 18/32, 18/30*

U.S. Cl. 428—425 **27 Claims**

1. A storage-stable latex of a quaternized polyurethane-urea comprising the chain-extended product of an isocyanate terminated quaternized polyurethane prepolymer, a chain-extending reagent and water, said chain-extending reagent having at least two groups reactive with primary amines, said groups selected from terminal epoxides, aldehydes and cyclic anhydrides said prepolymer being the reaction product of a polyol, a tertiary alkanolamine and a polyisocyanate quaternized with a di-lower alkyl sulfate.

4,160,066

AGE-HARDENABLE WELD DEPOSIT

Edwin R. Szumachowski, Springettsbury Township, York County, and Robert F. Miller, Dover Township, York County, both of Pa., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 840,897, Oct. 11, 1977, abandoned. This application Mar. 3, 1978, Ser. No. 883,139

Int. Cl.[2] B32B *15/18*

U.S. Cl. 428—683 **6 Claims**

1. An age hardenable iron-base alloy weld deposit consisting essentially of, in weight percent,

Carbon	0.2 maximum
Manganese	1.3 maximum
Silicon	1.0 maximum
Phosphorus	0.02 maximum
Sulfur	0.02 maximum
Chromium	3 to 10
Molybdenum	9 to 13.5
Cobalt	15 to 25
Nickel	0.3 maximum
Iron	Balance

wherein the ratio of (% chromium plus % molybdenum) of (% cobalt plus % nickel) is between about 0.75 and about 1.10

4,160,067

MOLTEN CARBONATE FUEL CELL CORROSION INHIBITION

Elias H. Camara, Bolingbrook; Leonard G. Marianowski, South Holland, and Rafael A. Donado, Chicago, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

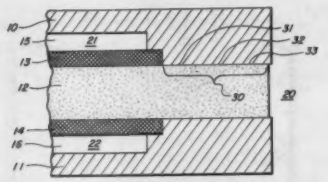
Filed Mar. 13, 1978, Ser. No. 886,257

Int. Cl.[2] H01M *2/02*

U.S. Cl. 429—16 **16 Claims**

1. Ferrous metal cell housing for use in high temperature molten carbonate fuel cells having an anode and a cathode ferrous metal cell housing defining a fuel chamber and an oxidant chamber, respectively, and separated by an electrolyte tile, the peripheral portion of said housings having a wet seal area surface in contact with said electrolyte tile comprising alkali metal carbonates and inert support material and operating at about 500° to about 700° C., said cell housing surface in the wet seal area comprising about 2 to about 70 weight percent aluminum prior to cell operation providing corrosion inhibition during fuel cell operation.

9. A method for inhibiting corrosion of ferrous metal housings defining a fuel chamber and an oxidant chamber separated by an electrolyte tile, the peripheral portion of said housings having a wet seal area surface in contact with an electrolyte tile comprising alkali metal carbonates and an inert support material and operating during fuel cell operation at about 500° to about 700° C., comprising providing in said cell housing surface wet seal area about 2 to about 70 weight percent aluminum prior to cell operation.



4,160,068

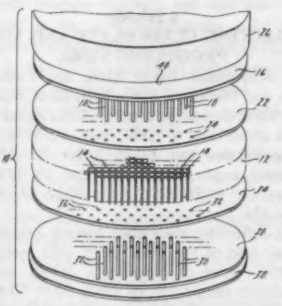
STORAGE BATTERY

Joseph T. Kummer, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 21, 1978, Ser. No. 962,579

Int. Cl.[2] H01M *2/12*

U.S. Cl. 429—32 **10 Claims**



1. A high power, low total energy storage battery comprising:

a honeycomb separator having a plurality of cells therein to define a plurality of separate anode and cathode compartments, said honeycomb separator being formed of a material having a porosity in the range which permits ions of electrolyte to flow therethrough, but does not permit flow of electrochemical materials therethrough, said honeycomb material also being resistant to attack by the materials forming the battery;

an anode in the form of a base with a plurality of projecting electrodes extending therefrom having a cross section smaller than the cross section of the cells of said honeycomb separator, said electrodes being received in a plurality of said cells to form anode compartments;

a cathode in the form of a base with a plurality of projecting electrodes extending therefrom having a cross section smaller than the cross section of said cells of said honeycomb separator, said electrodes being received in a plurality of said cells to form cathode compartments, said pro-

jecting electrodes of said anode and said cathode being so arranged in association with said cells that said anode and said cathode compartments are in a side-by-side relationship throughout said honeycomb separator;

sealing, gas venting and electrical insulating means for sealing off the ends of said anode and cathode compartments to make them fluid tight, to permit the escape of generated gases therefrom, and to electrically insulate said anode from said cathode;

an electrolyte in said anode compartments and said cathode compartments;

an anodic electrochemical material in said anode compartments;

a cathodic electrochemical material in said cathodic compartments; and

housing means for holding said honeycomb separator, said anode, said cathode, said sealing, gas venting and electrical insulating means, said electrolyte, and said electrochemical materials in an assembled condition.

4,160,069

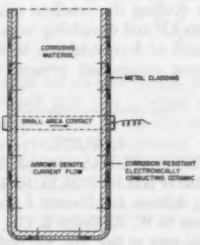
ELECTRICALLY CONDUCTIVE AND CORROSION RESISTANT CURRENT COLLECTOR AND/OR CONTAINER

Owen W. Johnson; Gerald R. Miller, both of Salt Lake City, Utah, and Paul S. Beutler, Richland, Wash., assignors to University of Utah, Salt Lake City, Utah

Continuation-in-part of Ser. No. 658,975, Feb. 18, 1976, abandoned. This application Feb. 18, 1977, Ser. No. 769,997

Int. Cl.[2] H01M *6/20*

U.S. Cl. 429—104 **18 Claims**



1. An improved electrically conductive current collector suitable for use in high temperature applications in the presence of corrosive environments, comprising:

(a) a high strength, noncorrosive electronically conductive, polycrystalline ceramic member of rutile which is doped with ionic metal species having a stablevalence in said polycrystalline ceramic of at least +5 which serves as the primary load bearing member of said current collector, said ceramic being substantially impervious to materials constituting said corrosive environment; and

(b) a highly electronically conductive metal cladding intimately attached to a substantial portion of one surface of said ceramic member, said metal cladding having a thickness sufficiently thin to be plastically deformable in relation to said ceramic which preserves the function of said ceramic member as the primary load bearing element of said current collector and being based on the relative elastic modulus of the metal of said metal compared to that of the ceramic member, said metal cladding being adapted to direct current flow through said ceramic member and to shunt said current between said member and an external contact.

4,160,070

ADDITIVE FOR HIGH DRAIN RATE LITHIUM CELLS

Nehemiah Margalit, Levittown, and Philip E. Krouse, Yardley, both of Pa., assignors to ESB United States, Inc., Philadelphia, Pa.

Filed Sep. 25, 1978, Ser. No. 945,414

Int. Cl.[2] H01M *6/14*

U.S. Cl. 429—194 **10 Claims**

1. An improvement in a high rate electrochemical cell having a lithium anode, a non-aqueous electrolyte comprised of a solvent and solute and a cathode, the improvement comprising having as an additive a minor portion of a tetra alkyl onium salt dissolved in the electrolyte.

4,160,071

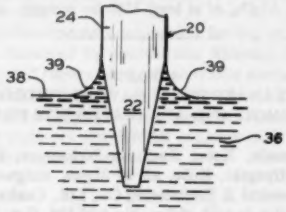
TAPERED PLATE LUG FOR CAST-ON POST COLLECTION BARS

John R. Parker, Toledo, Ohio, assignor to Barrett Battery, Inc., Toledo, Ohio

Filed May 12, 1978, Ser. No. 905,223

Int. Cl.[2] H01M *4/02*

U.S. Cl. 429—211 **2 Claims**



1. A secondary battery plate having a grid and a lug extending outwardly from one side edge of said grid in the same plane of the plate and of the same thickness as said side edge, said lug having a rectangular cross-section for about the first two-thirds of its length from said side edge, and then having at one end a wedge-shaped outer third of its length tapering to about one-quarter of said thickness of said lug whereby when the lug is inserted into the mold for a collector bar to be integrally cast thereon with the lugs of adjacent plate grids in a machine, said tapered ends are less than completely immersed in the melted metal in the mold so that the capillary action of the molten metal fills-in the unimmersed tapered portion of the lug to produce a lug connection from the grid to the collector bar which connection has a uniform cross-section of at least that of the untapered rectangular cross-section of the lug.

4,160,072

FOAMABLE AND CROSSLINKABLE POLYETHYLENE COMPOSITION, PROCESS FOR ITS PRODUCTION, AND PROCESS FOR PRODUCING CROSSLINKED POLYETHYLENE FOAMS USING SAID COMPOSITION

Ken Shinkai, Hirakata; Norio Chiba, Mukou, and Yutaka Ozaki, Mishima, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 668,251, Mar. 18, 1976. This application Oct. 31, 1977, Ser. No. 846,845

Claims priority, application Japan, Mar. 20, 1975, 50-33763

Int. Cl.[2] C08J *9/10*

U.S. Cl. 521—86 **31 Claims**

1. A foamable and crosslinkable polyethylene composition conprising

(a) modified polyethylene obtained by chemically bonding a silane compound containing at least one unsaturated group to polyethylene in the presence of a radical generator,

(b) zinc stearate as the silanol condensation catalyst, and

(c) azodicarbonamide as heat-decomposable blowing agent,

said ingredients (a), (b) and (c) having been melt-kneaded with one another at a temperature lower than the decomposition temperature of the heat-decomposable blowing agent.

4,160,073

FIRE PROOFING COMPOSITIONS

John B. Lloyd-Lucas, Pinvin, Nr. Pershore, and Christopher Lloyd-Lucas, Hunt End, Nr. Redditch, both of England, assignors to Advanced Fireproofing Systems Limited, England

Filed Mar. 9, 1977, Ser. No. 776,090

Claims priority, application United Kingdom, Mar. 12, 1976, 09928/76

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—122 19 Claims

1. An intumescent coating composition comprising a film-forming epoxy resin binder and a spumific agent in a weight ratio of less than 7.5:1 and, uniformably dispersed therethrough, from about 1 to about 15 percent by weight, based on the weight of the other components of the composition, of inorganic fibres having a silica content, expressed as SiO_2, of less than 50 percent by weight, and an aluminum oxide content, expressed as Al_2O_3, of at least 13% by weight.

4,160,074

POLYISOCYANATE FOAM HAVING ISOTROPIC CELLS AND METHOD AND APPARATUS FOR PREPARING SAME

Hiroshi Komada, Kobe; Kuniyasu Nakamura, Oosaka, and Ryoichi Miyagaki, Kobe, all of Japan, assignors to Nihon Soflan Chemical & Engineering Co., Ltd., Osaka City, Japan

Continuation-in-part of Ser. No. 625,526, Oct. 24, 1975, abandoned. This application Jan. 26, 1978, Ser. No. 872,678

Claims priority, application Japan, Sep. 12, 1975, 50-111453

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—155 13 Claims

1. A method of manufacturing a polyisocyanate foam molded product having a substantially isotropic cell structure, utilizing a mold having a closed bottom wall, an open top and upstanding side wall means defining a mold cavity having a closed perimeter, said side wall means comprising interconnected relatively movable wall portions capable of moving horizontally to expand the cross-sectional area of the mold cavity in the two mutually perpendicular horizontal directions of width and length while maintaining the perimeter of said mold cavity closed, and extending means connected to said wall portions for positively mechanically moving said wall portions in said two mutually perpendicular horizontal directions from an inner contracted position to an outer expanded position, said bottom wall having a size such that it closes the bottom of the mold cavity in all positions of said side wall means, which comprises the steps of:

placing a charge of liquid polyisocyanate foamable composition onto said bottom wall of said mold cavity while said wall portions are in said inner contracted position;

allowing the composition freely to rise vertically in said mold cavity toward the open top thereof by expansion caused by foaming of said composition, and, while the composition is still fluid and expanding and is free of externally applied pressure on the upper surface of said composition, operating said extending means and thereby positively mechanically moving said wall portions outwardly in said two mutually perpendicular horizontal directions to similar extents to expand the cross-sectional area of the mold cavity in both the width and length directions while maintaining the perimeter of said mold cavity closed whereby the composition expands also in said two mutually perpendicular horizontal directions to form a substantially isotropic cell structure.

4,160,075

PROCESS FOR THE PRODUCTION OF FOAMED PLASTICS WITH IMPROVED COMBUSTION CHARACTERISTICS

Leopold Golser, Leonding, Austria, assignor to Chemie Linz Aktiengesellschaft, Austria

Filed Jul. 11, 1978, Ser. No. 923,724

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1977, 2732105

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—158 7 Claims

1. In a process for the production of foamed plastics with improved combustion characteristics by a condensation reaction of aminoplast precondensates with organic isocyanates which are at least bifunctional in the presence of an acid curing catalyst and an accelerator for polyurethane formation selected from the group consisting of tertiary amines and tin salts containing metal organic bonds, whereby an aqueous solution of a water soluble precondensate of formaldehyde and an aminoplast forming compound selected from the group consisting of urea and melamine, the solution having a water content of 13 to 40% by weight, is added to the organic isocyanate which is already mixed with the accelerator for polyurethane formation, being used in an amount of 0.5 to 5% by weight relative to the foamable mixture and at the same time as the aqueous solution of the aminoplast precondensate but separately from it the acid curing catalyst is added, which is also used in an amount of 0.5 to 5% by weight, relative to the foamable mixture, whereby the ratio of water to organic isocyanate prior to the start of the reaction is 0.14 to 1.5 parts by weight of water to 1 part by weight of organic isocyanate the improvement wherein the water soluble aminoplast precondensate employed is a precondensate of this type in the form of an aqueous solution which has been obtained by reacting formaldehyde with the aminoplast-forming compound in a molar ratio of 1.80 to 4.5:1 at elevated temperature, the maximum temperature being the boiling point, and at pH values of 4 to 9.5, subsequently cooling the reaction mixture, adjusting the pH value to 7.0 to 8.0 and dissolving urea in an amount such that the molar ratio of formaldehyde to the total amount of aminoplast forming compound present in the solution is 1.0–2.1:1.

4,160,076

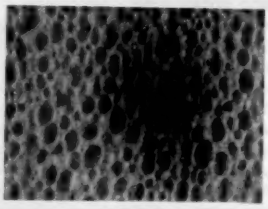
SIMULATED NATURAL SPONGE BASED ON HYDROPHILIC POLYURETHANE

James L. Guthrie, Ashton, and Donald J. Bach, Baltimore, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 577,969, May 15, 1975, abandoned. This application Jul. 15, 1977, Ser. No. 816,055

Int. Cl.[2] C08G *18/14, 18/10, 18/48*

U.S. Cl. 521—159 8 Claims



1. A method for preparation of new improved hydrophilic crosslinked polyurethane foams which simulate natural sponges which comprises reacting a first component comprising isocyanate capped polyoxyethylene polyol having a reaction functionality greater than two, said polyol being substantially void of reactive hydroxy groups and having a molecular weight of from about 200 to about 20,000, with a second component comprising aqueous reactant, the ratio of moles H_2O/-moles NCO groups being about 6.5 to about 390 in said second

and first components respectively, said aqueous reactant having dissolved therein a liquid defoaming agent and non-ionic surface-active agent, the non-ionic surface-active agent having a high hydrophilic/lipophilic balance in the range of about HLB 14 to about HLB 18, whereas the liquid defoaming agent has a low hydrophilic/lipophilic balance of about HLB 5.5 to about HLB 8, and wherein the concentration of the liquid defoaming agent in the aqueous water phase prior to the foaming reaction is from about 0.3% to about 3.0% by weight of the aqueous phase, and the concentration of the non-ionic surface-active agent in the aqueous water phase prior to the foaming reaction is from about 0.05% to about 0.3% by weight of the aqueous phase.

4,160,077

PROCESS OF CROSSLINKING UNSATURATED HYDROCARBON POLYMERS EMPLOYING NOVEL CARBAMATES

John L. Brooks; Richard Budziarek, and David J. Harper, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

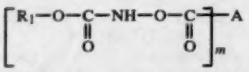
Continuation of Ser. No. 767,330, Feb. 10, 1977. This application Jan. 6, 1978, Ser. No. 868,062

Claims priority, application United Kingdom, Feb. 25, 1976, 7419/76

Int. Cl.[2] C08C *19/12, 19/22, 19/28;* **C08J** *3/24*

U.S. Cl. 525—332 **7 Claims**

1. A process for the cross-linking of hydrocarbon polymers which contain ethylenically unsaturated groups which comprises forming an intimate mixture of the polymer with a carbamate of the formula:



wherein R_1 is an alkyl or alkenyl group of 1 to 20 carbon atoms, benzyl or phenyl, m is 1 or 2, when m is 1, A is H, an alkyl or alkenyl group of 1 to 20 carbon atoms, phenyl, hydroxyphenyl, carboxyphenyl, nitrophenyl or chlorophenyl and when m is 2, A is phenylene or an alkylene or alkenylene radical of 2 to 4 carbon atoms.

4,160,078

POLYMERS CONTAINING LATERALLY SUBSTITUTED ISOCYANATE GROUPS AND THEIR PREPARATION

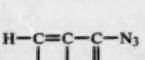
David H. Kohn, Haifa, and Aharon Liebersohn, Kiryat Bialik, both of Israel, assignors to Technion Research and Development Foundation, Ltd., Haifa, Israel

Filed Jul. 8, 1976, Ser. No. 703,536

Int. Cl.[2] C08F *4/04, 26/00, 20/70*

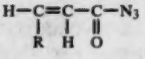
U.S. Cl. 526—218 **15 Claims**

1. Polymers containing laterally substituted isocyanate groups obtained by polymerizing acyl azide monomers of the formula



where R is an aromatic radical with at least one vinyl monomer, in a free-radical initiator system wherein the polymers contain only isocyanate groups that have replaced acyl azide groups and contain no residual acyl azide groups.

7. A method for the preparation of polymers containing laterally substituted isocyanate groups, by the polymerization of acyl azide monomers of the formula



where R is an aromatic radical with at least one vinyl monomer in the presence of a free radical initiator system.

4,160,079

NOVEL SULFUR COMPOUND MODIFIERS FOR CHLOROPRENE POLYMERIZATION

Morris S. Edmondson, Alvin, Tex., assignor to Denka Chemical Corporation, Houston, Tex.

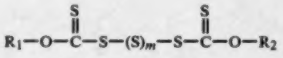
Continuation of Ser. No. 605,308, Aug. 18, 1975, abandoned, which is a division of Ser. No. 541,237, Jan. 15, 1975, Pat. No. 3,923,763, which is a continuation-in-part of Ser. No. 289,521, Sep. 15, 1972, abandoned. This application Sep. 9, 1977, Ser. No. 831,773

The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.

Int. Cl.[2] C08F *2/00, 4/28, 214/14, 34/00*

U.S. Cl. 526—295 **4 Claims**

1. A polychloroprene composition having excellent aging stability as measured by controllable Mooney viscosity and producing cured rubber having high tensile strength and modulus properties, produced by the process which comprises polymerizing chloroprene in the presence of from about 0.05 to 5 parts by weight per 100 parts of polymerizable monomer of a modifier having the formula



wherein R_1 is a hydrocarbon radical having from 1 to 8 carbon atoms, R_2 is a hydrocarbon radical having 1 to 8 carbon atoms and m is 1 to 4.

4,160,080

PROCESS FOR THE PREPARATION OF ALLOPHANATES WHICH CONTAIN ISOCYANATE GROUPS

Kalus Köenig, Leverkusen; Wolfgang Reichmann, Dusseldorf, and Josef Pedain, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany.

Filed Jun. 29, 1978, Ser. No. 920,562

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1977, 2729990

Int. Cl.[2] C08G *18/79;* **C07C** *118/00*

U.S. Cl. 528—59 **13 Claims**

1. Process for the preparation of allophanates containing aliphatically and/or cycloaliphatically bound isocyanate groups comprising reacting organic compounds which contain urethane groups with organic polyisocyanates containing aliphatically and/or cycloaliphatically bound isocyanate groups, characterized in that the reaction is carried out in the presence of strong acids which form a mixed carbamic acid anhydride with aliphatic or cycloaliphatic isocyanates.

10. A process for the production of storage stable allophanate polyisocyanates comprising reacting

(i) organic compounds which contain urethane groups with

(ii) organic polyisocyanates containing aliphatically and/or cycloaliphatically bound isocyanate groups,

characterized in that the reaction is carried out in the presence of strong acids which form a mixed carbamic acid anhydride with aliphatic or cycloaliphatic isocyanates and any excess isocyanate is removed from the reaction mixture.

4,160,081

IMIDYL- AND ISOIMIDYL-PHTHALIC ANHYDRIDES, PROCESS FOR THEIR MANUFACTURE AND THEIR USE FOR CURING EPOXIDE RESINS

Vratislav Kvita, Muttenz; Roland Darms, Therwil, and Gerd Greber, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 707,923, Jul. 22, 1976, Pat. No. 4,131,613, which is a division of Ser. No. 531,030, Dec. 9, 1974, Pat. No. 3,979,393. This application Jul. 10, 1978, Ser. No. 922,894

Claims priority, application Switzerland, Dec. 20, 1973, 17903/73

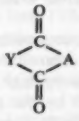
Int. Cl.[2] **C08G** *59/42*

U.S. Cl. 528—93 **3 Claims**

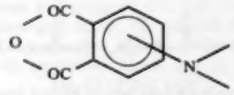
1. A curable mixture which is suitable for the manufacture moldings, impregnations, coatings and adhesive bonds comprising:

(a) an epoxide compound containing at least two epoxide groups per molecule; and

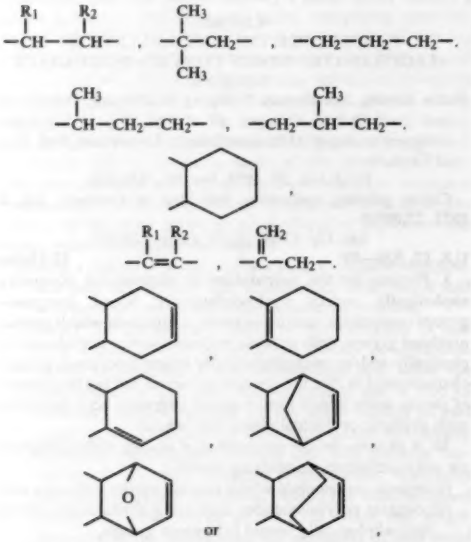
(b) a curing agent selected from the group consisting of compounds with at least one imidyl-phthalic anhydride of the formula



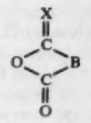
wherein Y represents the divalent radical



and A represents a divalent radical selected from the group consisting of

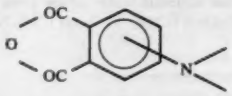


R_1 and R_2 independently of one another denote hydrogen, chlorine, bromine or methyl, or compounds with at least one isoimidyl-phthalic anhydride of the formula

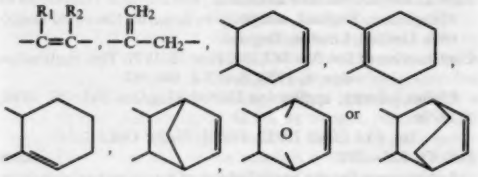


(I)

wherein X represents the divalent radical



and B represents a divalent radical selected from the group consisting of



where R_1 and R_2 independently of one another denote hydrogen, chlorine, bromine or methyl.

4,160,082

INTERMEDIATES FOR AMINOGLYCOSIDE ANTIBIOTICS

William A. Million, Ramsgate; Rhona M. Plews, and Kenneth Richardson, both of Canterbury, all of England, assignors to Pfizer Inc., New York, N.Y.

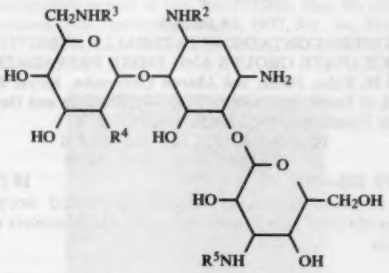
Continuation-in-part of Ser. No. 784,979, Apr. 6, 1977, abandoned. This application Nov. 14, 1977, Ser. No. 851,400

Claims priority, application United Kingdom, Apr. 14, 1976, 15421/76

Int. Cl.[2] **C07H** *15/22;* **C07G** *11/00*

U.S. Cl. 536—10 **11 Claims**

1. A compound of the formula



wherein

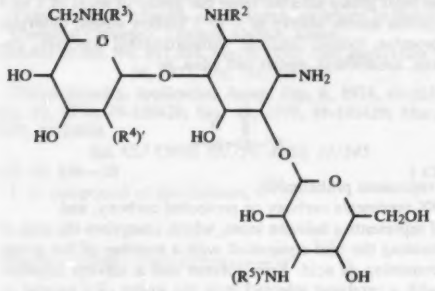
R^2 is selected from the group consisting of hydrogen and benzyl;

R^4 is selected from the group consisting of hydroxy and R^6NH;

and R^3, R^5 and R^6 are each selected from the group consisting of formyl, alkanoyl having from 2 to 5 carbon atoms, fluoroacetyl, difluoroacetyl, trifluoroacetyl, chloroacetyl, dichloroacetyl, trichloroacetyl, alkoxycarbonyl having from 2 to 5 carbon atoms and benzoyl;

provided that R^3, R^5 and R^6 are always the same.

8. A process for the preparation of a compound of the formula



IA

wherein

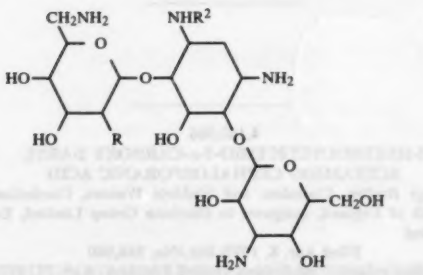
R^2 is selected from the group consisting of hydrogen and benzyl;

$(R^4)'$ is selected from the group consisting of hydroxy and $NH(R^6)'$;

and $(R^3)'$, $(R^5)'$ and $(R^6)'$ are each selected from the group consisting of formyl, alkanoyl having from 2 to 5 carbon atoms, fluoroacetyl difluoroacetyl, trifluoroacetyl, chloroacetyl, dichloroacetyl and trichloroacetyl;

provided that $(R^3)'$, $(R^5)'$ and $(R^6)'$ are always the same; which comprises:

(a) reacting a comound of the formula



(II)

wherein R is selected from the group consisting of hydroxy and amino and R^2 is selected from the group consisting of hydrogen and benzyl, with an excess of formic-acetic anhydride or $(R^7CO)_2O$, in a reaction-inert solvent, at a pH below about 5 to achieve selective O-acylation of the reactive hydroxy groups, wherein R^7 is selected from the group consisting of alkyl having from 1 to 4 carbon atoms, fluoromethyl, difluoromethyl, trifluoromethyl, chloromethyl, dichloromethyl and trichloromethyl;

(b) neutralizing a solution of the product of step (a), in a reaction-inert organic solvent, and at a temperature of from about 0° to about 50° C., to achieve O→N acyl migration; and

(c) hydrolyzing the product of step (b) at a temperature of from about 0° to about 100° C., to remove any remaining O-acyl groups.

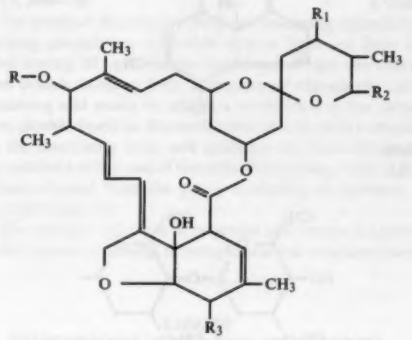
4,160,083

PROCESS FOR THE SEPARATION OF ANTIBIOTIC MACROLIDES

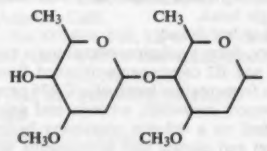
Lucille J. Cole, Roselle Park, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 3, 1977, Ser. No. 838,710
Int. Cl.² C07H *17/08*
U.S. Cl. 536—17 A **2 Claims**

1. A method for the separation of C-076 compounds wherein said C-076 compounds have the formula:



wherein R is:



and wherein the broken line indicates a single or a double bond; R_1 is hydroxy an is present only when said broken line indicate. a single bond.

R_2 is propyl or butyl; and

R_3 is methoxy or hydroxy

into components A and B from a solution containing a mixture of said components obtained from the extraction of the fermentation broth of a C-076 producing strain of *Streptomyces avermitilis* wherein said solution is applied to a column of Sephadex LH-20 and subsequently eluted with a solvent mixture of from 8 to 10 parts of methylene chloride or chloroform, from 8 to 10 parts of hexane or heptane and from 0.5 to 2 parts of methanol or ethanol.

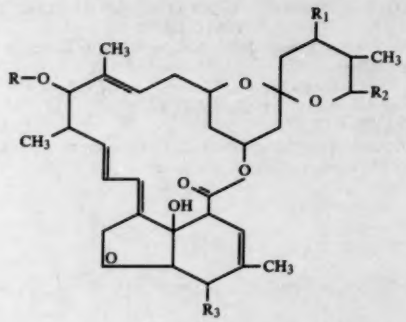
4,160,084

METHOD FOR THE SEPARATION OF ANTIBIOTIC MACROLIDES

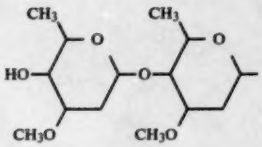
Thomas W. Miller, Carteret; Kenneth E. Wilson, Woodbridge, and Robert E. Ormond, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 11, 1977, Ser. No. 840,921
Int. Cl.² C07H *17/08*
U.S. Cl. 536—17 A **6 Claims**

1. A process for the preparation of C-076 B1 and B2 components, wherein said C-076 B1 and B2 components have the structure:



wherein
R is:



and wherein the broken line indicates a single or a double bond; R_1 is hydroxy and is present only when said broken line indicates a single bond;

R_2 is propyl or butyl; and

R_3 is hydroxy, from a solution containing a mixture of said C-076 B1 and B2 components obtained from the extraction of the fermentation broth of a C-076 producing strain of *Streptomyces avermitilis*, wherein said solution is chromatographed on a column containing hydroxyalkylated dextran gel and eluting said components with a solvent mixture of low boiling hydrocarbons: toluene, benzene or xylene: lower alcohols in the ratio of 30–90:10–60:5–25 and recovering said components.

4,160,085

CYCLIZATION TO FORM CEPHEM RING AND INTERMEDIATES THEREFOR

Teruji Tsuji, Takatsuki; Yoshio Hamashima, Kyoto; Mitsuru Yoshioka, Toyonaka; Masayuki Narisada, Ibaraki; Hiroshi Tanida; Taichiro Komeno, both of Osaka, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

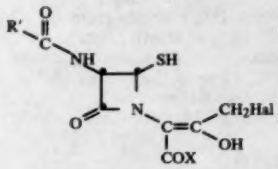
Division of Ser. No. 658,665, Feb. 17, 1976, Pat. No. 4,079,181. This application Dec. 1, 1977, Ser. No. 856,806

Claims priority, application Japan, Feb. 17, 1975, 50-19612; Feb. 21, 1975, 50-22229; Mar. 7, 1975, 50-28452; Mar. 30, 1975, 50-33808

Int. Cl.[2] C07D *501/02*

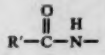
U.S. Cl. 544—16 **5 Claims**

1. A process for cyclizing a compound represented by the formula



wherein

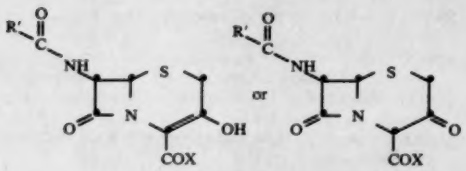
R′ represents a member selected from the group consisting of (1) hydrogwen, (2) C_1 to C_4 alkyl, (3) phenyl, (4) α-chlorobenzyl, (5) ArCQQ, (6) Ar-G-CQQ wherein Q represents hydrogen or methyl, G represents oxygen or sulfur and Ar represents (a) phenyl, (b) dihydrophenyl, (c) monocyclic heterocyclic aromatic containing from 1 to 4 hereto atoms selected from the group of nitrogen, oxygen and sulfur or (d) one of said groups (a) to (c) substituted by an inert group selected from the group of alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, chlorine, bromine, iodine, fluorine, trifluoromethyl hydroxy, cyano, aminoethyl, amino and nitro, or



represents phthalimido,

COX represents carboxy or protected carboxy, and

Hal represents a halogen atom, which comprises the step of treating the said compound with a member of the group consisting of acid, base, solvent and a solvent together with a catalyzer selected from the group of a neutral or basic silica gel, alumina, diatomaceous earth and fluorisil to give a compound represented by the formula



4,160,086

3-HETEROCYCLICTHIO-7-α-CARBOXY 2-ARYL ACETAMIDO CEPHALOSPORANIC ACID

George Burton, Coulsdon, and Elzbieta Watson, Carshalton, both of England, assignors to Beecham Group Limited, England

Filed Apr. 8, 1975, Ser. No. 566,060

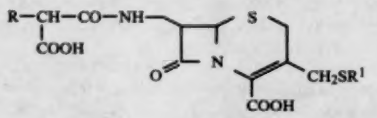
Claims priority, application United Kingdom, Apr. 27, 1974, 18557/74; Jul. 25, 1974, 32806/74

The portion of the term of this patent subsequent to Nov. 23, 1993, has been disclaimed.

Int. Cl.[2] C07D *501/36*

U.S. Cl. 544—26 **10 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable salt or 4-carboxylic acid mono-ester thereof:



(I)

wherein R is 2- or 3-thienyl or phenyl or 4-hydroxyphenyl, and R^1 represents thiadiazolyl or tetrazolyl unsubstituted or substituted by lower alkyl.

4,160,087

N-ACYLAMINO-α-ARYLACETAMIDO CEPHALOSPORINS

Hirotada Yamada, Nishinomiya; Kousaku Okamura, Takarazuka; Hisao Tobiki, Kobe; Norihiko Tanno, Ashiya; Kozo Shimago, Toyonaka; Takenari Nakagome, Nishinomiya; Toshiaki Komatsu, Takarazuka; Akio Izawa, Kawanishi; Hiroshi Noguchi, Nishinomiya; Kenji Irie, Takarazuka, and Yasuko Eda, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

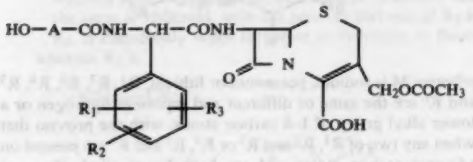
Division of Ser. No. 611,104, Sep. 8, 1975. This application May 10, 1977, Ser. No. 795,596

Claims priority, application Japan, Sep. 6, 1974, 49-103183; Sep. 19, 1974, 49-108428; Sep. 19, 1974, 49-108429; Mar. 20, 1975, 50-33824

Int. Cl.[2] C07D *501/34;* A61K *31/545*

U.S. Cl. 544—28 1 Claim

1. A compound of the formula,



wherein A is cinnoline, naphthyridine, pyridopyrazine, thiazolopyrimidine, pyridopyrimidine, pyridine, pyrimidine, or pyridazine, each of which can be substituted with one or more substituents selected from the group consisting of a (C_1–C_4)alkyl group, a (C_1–C_4)alkoxy group, a (C_1–C_4)alkylthio group and a hydroxy group and wherein the hydroxy group attached to A is ortho to the amido group attached to A; R_1 is an amino group, a hydroxy group, a hydroxymethyl group or a ureido group; and R_2 and R_3, which may be the same or different, each is chloro, fluoro, methoxy or hydroxy, and the non-toxic pharmaceutically acceptable salts thereof.

4,160,088

DIHYDROOXADIAZINONES AND METHOD FOR MAKING

George E. Niznik, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 608,450, Aug. 28, 1975, Pat. No. 4,097,671. This application Apr. 21, 1977, Ser. No. 789,420

Int. Cl.[2] C07D *273/04*

U.S. Cl. 544—68 19 Claims

1. In the process for making an α-halo ketone involving the halogenation of an α-dihydro ketone in the presence of an effective amount of a mineral acid catalyst or a Lewis Acid catalyst resulting in the production of the α-halo ketone along with significant amounts of poly α-halogenated ketone, the improvement which comprises halogenating the α-dihydro ketone in the range of from 0° C. to 50° C. in the presence of the Lewis Acid catalyst or mineral acid catalyst along with from 1 to 20 parts, per part of the ketone of a $C_{(1-8)}$ aliphatic alcohol, to provide for the recovery of α-halo ketone substantially free of poly α-halogenated ketone.

4,160,089

UTILIZATION OF ORTHOPHOSPHORIC ESTERS FOR THE PRODUCTION OF AQUEOUS FLUIDS FOR WORKING METALS

Giancarlo Bussi, and Pierpaolo Baradel, both of Trieste, Italy, assignors to Aquila S.p.A., Trieste, Italy

Continuation of Ser. No. 702,1??, Jul. 2, 1976, abandoned, which is a division of Ser. No. 516,029, Oct. 18, 1974, Pat. No. 3,983,098. This application Jul. 15, 1977, Ser. No. 816,508

Claims priority, application Italy, Oct. 18, 1973, 30279 A/73

Int. Cl.[2] A23J *7/00;* C07F *9/02;* C11C *3/00*

U.S. Cl. 544—78 4 Claims

1. The product obtained by the steps consisting essentially of esterifying phosphorus pentoxide with at least one fatty acid alcohol having 10 to 20 carbon atoms and at least one carbon-carbon double bond to form a mixture of phosphoric esters, chlorinating said esters by addition of chlorine to the carbon-carbon double bond in the molecules of said esters obtained from the esterifying step, and salifying the thus chlorinated esters obtained at the end of the chlorinating step, with at least one base selected from the group consisting of an alkali, an amine and ammonia.

4. The product of claim 1, wherein said amine is selected from the group consisting of morpholine and triethanolamine.

4,160,090

NITROPHENYLHYDRAZINE COMPOUNDS

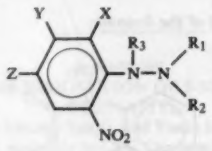
Don L. Hunter, Anaheim; William G. Woods, Fullerton; James D. Stone, Whittier, all of Calif., and Cecil W. LeFevre, Franklin, Id., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Division of Ser. No. 657,664, Feb. 12, 1976, which is a division of Ser. No. 529,655, Dec. 4, 1974. This application Nov. 7, 1977, Ser. No. 849,385

Int. Cl.[2] C07D *211/06, 295/00*

U.S. Cl. 544—164 8 Claims

1. A compound of the formula



wherein X is selected from hydrogen and nitro, Y is halo, Z is selected from halo and trifluoromethyl, R_3 is selected from hydrogen and lower alkyl, and R_1–R_2 taken together represent an alkylene, alkyleneimino or alkyleneoxy linkage having two to six carbon atoms in the chain.

4,160,091

PROCESS FOR PREPARATION OF 3-HALO-3-METHYLCEPHAMS

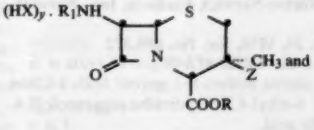
David K. Herron, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 21, 1977, Ser. No. 853,065

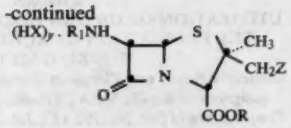
Int. Cl.[2] C07D *501/02*

U.S. Cl. 544—16 10 Claims

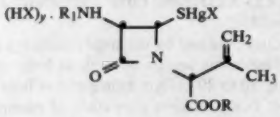
1. A process for preparing compounds of the formula



-continued



which comprises reacting a compound of the formula



with at least at equivalent of a positive halogenating agent selected from the group consisting of chlorine, sulfuryl chloride, tert-butylhypochlorite, bromine and sulfuryl bromide in an inert organic solvent

wherein in the above formula, X is chloro or bromo, R is hydrogen or a carboxylic acid ester protecting group, R_1 is hydrogen or an acyl group derived from a carboxylic acid, Z is chloro or bromo and y is 0 or 1 provided that when R_1 is an acyl group y is 0.

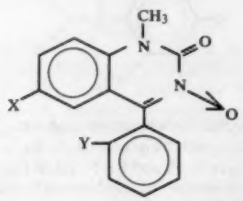
4,160,092

QUINAZOLINONE OXIDES AND THEIR USE AS INTERMEDIATES FOR PHARMACEUTICAL AGENTS

Elena M. Bingham, Wilmington, Del., and Arthur J. Elliott, Cedar Grove, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 16, 1977, Ser. No. 807,074
Int. Cl.[2] C07D *239/82*
U.S. Cl. 544—286 **6 Claims**

1. A compound of the formula:



where

X is Cl, Br, NO_2 or CF_3; and

Y is H, Br, Cl, or F.

4,160,093

6-ETHYL-6,9-DIHYDRO-9-OXOPYRAZOLO[3,4-f]QUINOLINE-9-CARBOXYLIC ACID

Thomas J. Schwan, and Raymond Freedman, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,372
Int. Cl.[2] C07D *471/04*
U.S. Cl. 546—82 **1 Claim**

1. The compound 6-ethyl-6,9-dihydro-9-oxopyrazolo[3,4-f]quinoline-8-carboxylic acid.

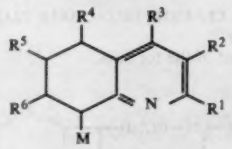
4,160,094

TETRAHYDROQUINOLINE DERIVATIVES

Adrian C. W. Curran, Newcastle-upon-Tyne; Roger Crossley, Reading, and David G. Hill, Cookham, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, United Kingdom

Continuation-in-part of Ser. No. 460,265, Apr. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 403,289, Oct. 3, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,903
Int. Cl.[2] C07D *215/16*
U.S. Cl. 546—152 **12 Claims**

1. An organic solution of a compound of formula



wherein M is sodium, potassium or lithium, R^1, R^2, R^3, R^4, R^5 and R^6 are the same or different and represent hydrogen or a lower alkyl group of 1–6 carbon atoms, with the proviso that when any two of R^1, R^2 and R^3 or R^4, R^5 and R^6 are present on adjacent carbon atoms and are both lower alkyl, they are selected from normal and secondary alkyl groups.

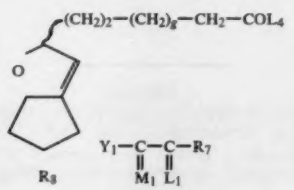
4,160,095

7,8-DIDEHYDRO-PGI$_1$ AMIDES

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 869,141, Jan. 13, 1978. This application Jul. 3, 1978, Ser. No. 921,630
Int. Cl.[2] C07D *307/93*
U.S. Cl. 542—426 **63 Claims**

1. A prostacyclin intermediate of the formula



wherein g is the integer one, 2, or 3;

wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;

wherein Y_1 is

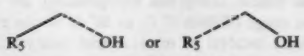
trans-CH=CH—, (1)

cis-CH=CH—, (2)

$—CH_2CH_2—$, or (3)

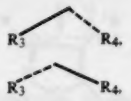
—C≡C—; (4)

wherein M_1 is

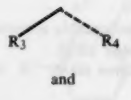


wherein R_5 is hydrogen or methyl;

wherein L_1 is



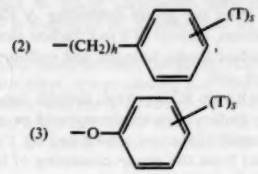
or a mixture of



and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; wherein R_7 is

$$-(CH_2)_m-CH_3, \qquad (1)$$

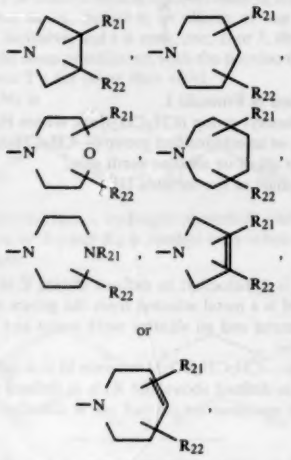


wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl; and

wherein L_4 is

(a) amino of the formula $-NR_{21}R_{22}$; wherein R_{21} and R_{22} are
(i) hydrogen;
(ii) alkyl of one to 12 carbon atoms, inclusive;
(iii) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(iv) aralkyl of 7 to 12 carbon atoms, inclusive;
(v) phenyl;
(vi) phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(vii) carboxyalkyl of one to 4 carbon atoms, inclusive;
(viii) carbamoylaklyl of one to 4 carbon atoms, inclusive;
(ix) cyanoalkyl of one to 4 carbon atoms, inclusive;
(x) acetylalkyl of one to 4 carbon atoms, inclusive;
(xi) benzoylalkyl of one to 4 carbon atoms, inclusive;
(xii) benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;
(xiii) pyridyl;
(xiv) pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive;
(xv) pyridylalkyl of one to 4 carbon atoms, inclusive;
(xvi) pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, or alkoxy of one to 3 carbon atoms, inclusive;
(xvii) hydroxyalkyl of one to 4 carbon atoms, inclusive;
(xviii) dihydroxyalkyl of one to 4 carbon atoms, or
(xix) trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl;

(b) cycloamino selected from the group consisting of



wherein R_{21} and R_{22} are as defined above;

(c) carbonylamino of the formula $-NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above;

(d) sulfonylamino of the formula $-NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined above; or

(e) hydrazino of the formula $-NR_{23}R_{24}$, wherein R_{23} is as defined above and R_{24} is amino of the formula $-NR_{21}R_{22}$, as defined above, or cycloamino, as defined above.

4,160,096

PROCESS FOR PRODUCTION OF 5-NITROIMIDAZOLE DERIVATIVES

Franjo Kajfez; Vitomir Sunjic, and Vesna Sunjic, all of Chiasso, Switzerland, assignors to CRC Compagnia di Ricerca Cimica S.A., Chiasso, Switzerland

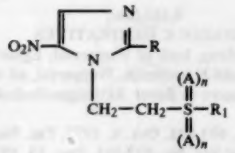
Continuation of Ser. No. 720,613, Sep. 3, 1976, which is a continuation of Ser. No. 569,383, Apr. 18, 1975, abandoned. This application Jul. 27, 1978, Ser. No. 928,832

Claims priority, application Switzerland, Apr. 19, 1974, 5459/74

Int. Cl.[2] ***C07D 233/94***

U.S. Cl. 548—338 **3 Claims**

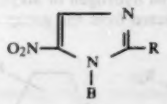
1. A process for making derivatives of 5-nitroimidazoles of the formula I:



(I)

wherein
R is alkyl having 1–4 carbon atoms,
R_1 is alkyl having 1–4 carbon atoms,
A is oxygen, and
n is 1,

which comprises reacting a compound having the formula II:



(II)

wherein
R is as defined in Formula I,
B is a 2'-haloethyl group (CH_2CH_2Hal), where Hal is a halogen atom, or an ethylsulfino group ($—CH_2CH_2SO_2H$) in the form of its alkali or alkaline earth salts,
with compounds of the formula III:

$$Z—R, \qquad \text{(III)}$$

wherein
(a) when B is 2'-haloethyl as defined above, Z is $—SO_2—M$ wherein M is a metal selected from the group consisting of an alkali metal and an alkaline earth metal and R_1 is as defined above,
(b) when B is $—CH_2CH_2SO_2M$ wherein M is as defined above, Z is halo as defined above and R_1 is as defined above, and
wherein said reactions are carried out in dimethylformamide.

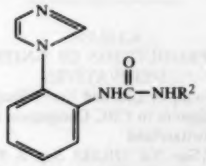
4,160,097

1-(2-PHENYLUREYLENE)IMIDAZOLES

Paul L. Warner, Jr., Clarence, and Edward J. Luber, Jr., Buffalo, both of N.Y., assignors to Westwind Pharmaceuticals, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 757,640, Jan. 7, 1977, abandoned. This application Dec. 8, 1977, Ser. No. 858,515
Int. Cl.[2] C07D *233/60*
U.S. Cl. 548—346 **39 Claims**

1. A 1-(2-phenylureylene)imidazole of the formula:



wherein: R^2 is a radical bonded to the nitrogen by a carbon to nitrogen linkage and is selected from the group consisting of phenyl and mono, di- or tri-substituted phenyl wherein the substituent is selected from the group consisting of alkyl, isoalkyl, alkoxy, acyloxy, halogen, cyano, acetyl, nitro, alkyl mercapto, phenoxy, alkyl phenoxy and trifluoro methyl.

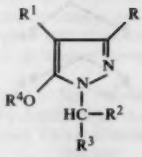
4,160,098

PYRAZOLE DERIVATIVES

Eike Möller; Karl Meng, both of Wuppertal; Egbert Wehinger, Neviges, and Harald Horstmann, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 691,891, Oct. 6, 1975, Pat. No. 4,096,152, which is a division of Ser. No. 532,311, Dec. 13, 1974, Pat. No. 4,002,641. This application Apr. 28, 1977, Ser. No. 791,840
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1973, 2363511
Int. Cl.[2] C07D *403/12, 405/12, 409/12*
U.S. Cl. 548—374 **10 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein
R is hydrogen or lower alkyl;
R^1 is hydrogen or lower alkyl;
R^2 is lower alkyl;
R^3 is phenyl substituted by:
(a) one or two of the same or different substituents selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, and alkoxy of 1 to 6 carbon atoms;
(b) one substituent selected from the group consisting of cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms and nitro;
(c) one substituent selected from the group consisting of cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms and nitro and one or two substituents selected from the group consisting of alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, alkoxy of 1 to 6 carbon atoms, halogen and trifluoromethyl; or
R^3 is naphthyl; and
R^4 is R^5CO wherein R^5 is pyrryl, thienyl, furyl, dihydrofuryl, tetrahydrofuryl, tetrahydropyranyl or tetrahydrothiopyranyl unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of halogen, alkyl of 1 to 4 carbon atoms, and nitro.

4,160,099

LABILE, NON-HETEROCYCLIC QUATERNARY AMMONIUM SALT/ESTERS AS TRANSIENT DERIVATIVES

Nicolae S. Bodor, Lawrence, Kans., assignor to Interx Research Corporation, Lawrence

Continuation-in-part of Ser. No. 482,513, Jun. 24, 1974, Pat. No. 3,998,815. This application Sep. 20, 1976, Ser. No. 724,914
The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.
Int. Cl.[2] C07C *93/18*
U.S. Cl. 560—110 **7 Claims**

1. A compound selected from the group consisting of ω-(diethyl-pivaloyloxymethyl-ammonium)-2,6-dimethyl-acetanilide chloride; N-ethylephedrine (α-acetyloxyethyl) chloride; 2-diethylaminopropiophenone heptanoyloxymethyl chloride; 6-dimethylamino-4,4-diphenyl-3-heptanone-N-heptanoyloxmethyl chloride; 6-dimethylamino-4,4-diphenyl-3-heptanone-N-acetyloxymethyl chloride; and 4-dimethylamino-3-methyl-1,2-diphenyl-2-butanol propionate N-hexanoyloxymethyl chloride.

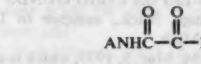
4,160,100

OXAMIC ACID DERIVATIVES

John H. Sellstedt, Pottstown; Charles J. Guinosso, King of Prussia, both of Pa., and Albert J. Begany, Tucson, Ariz., assignors to American Home Products Corporation, New York, N.Y.

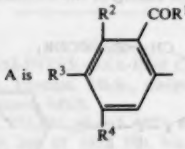
Continuation-in-part of Ser. No. 542,465, Jan. 20, 1975, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, Mar. 23, 1973, abandoned. This application Mar. 23, 1976, Ser. No. 669,567
Int. Cl.[2] C07C *101/54*
U.S. Cl. 560—43 **31 Claims**

1. A compound of the formula:



in which

R is a member selected from the group consisting of lower alkoxy, cyclohexyloxy and phenoxy; and



wherein

R^1 is a member selected from the group consisting of hydroxyl, lower alkyl, lower alkoxy, lower alkylamino and amino radicals;

R^2 is a member selected from the group consisting of hydrogen, lower alkoxy, hydroxy(lower)alkoxy, N-mono and di- lower alkylamino(lower)alkoxy, halo, phenoxy(lower-)alkoxy, 2-(lower alkoxy oxalyloxy)ethoxy, benzyloxy, mono- and di- lower alkylamino with the proviso that when R^2 is hydrogen R^1 is other than hydroxyl or lower alkoxy;

R^3 is a member selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halo and nitro; and

R^4 is a member selected from the group consisting of hydrogen, lower alkyl and lower alkoxy; with the proviso that one of R^2, R^3 and R^4 must be other than hydrogen.

4,160,101

ω-ARYL-13,14-DIDEHYDRO-INTER-OXA PGE COMPOUNDS

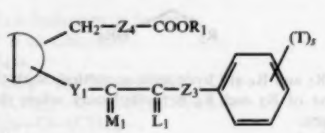
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 776,552, Mar. 7, 1977, which is a division of Ser. No. 657,739, Feb. 13, 1976, Pat. No. 4,029,681. This application Apr. 28, 1978, Ser. No. 900,970

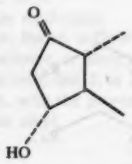
Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—53 **37 Claims**

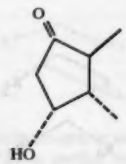
1. A prostaglandin analog of the formula:



wherein D is



or



wherein Y_1 is —C≡C—;

wherein Z_4 is

(1) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,

(2) —$(CH_2)_2$—O—$(CH_2)_g$—CH_2—, or

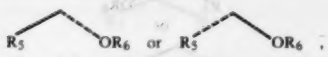
(3) —$(CH_2)_3$—O—$(CH_2)_g$—,

wherein g is one, 2, or 3;

wherein Z_3 is oxa or methylene;

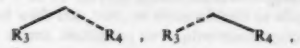
wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein M_1 is

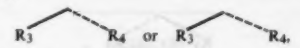


wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro and Z_3 is methylene; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,160,102

ω-ARYL-INTER-OXA-9-DEOXY-PGD$_1$ COMPOUNDS

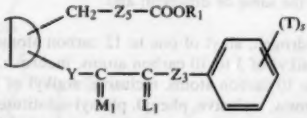
David C. Peterson, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 809,249, Jun. 23, 1977, which is a division of Ser. No. 614,244, Sep. 17, 1975. This application May 8, 1978, Ser. No. 903,625

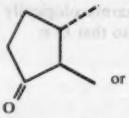
Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—53 **25 Claims**

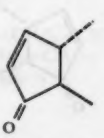
1. A prostaglandin analog of the formula



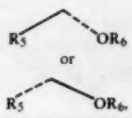
wherein D is



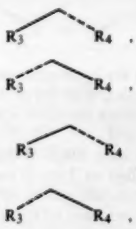
or



wherein
Y is cis-CH=CH—, trans-CH=CH—, or $—CH_2CH_2—$;
wherein Z_5 is
(1) $—CH_2—O—CH_2—(CH_2)_g—CH_2—$,
(2) $—(CH_2)_2—O—(CH_2)_g—CH_2—$, or
(3) $—(CH_2)_3—O—(CH_2)_g—$,
wherein g is one, 2, or 3;
wherein M_1 is



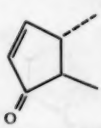
wherein
R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



or a mixture of

and

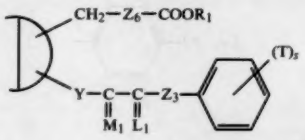
wherein
R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is hydrogen or fluoro only when the other is hydrogen or fluoro;
wherein
Z_3 is oxa or methylene;
wherein
T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different; and
wherein
R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; with the further proviso that D is



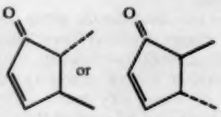
only when Y is $—CH_2CH_2—$.

4,160,103
ω-ARYL-CIS-13-PGA COMPOUNDS
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 774,186, Mar. 3, 1977, which is a division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application May 8, 1978, Ser. No. 904,184
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—53 **37 Claims**

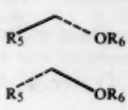
1. A prostaglandin analog of the formula:



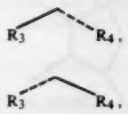
wherein D is



wherein Y is cis-CH=CH—;
where Z_6 is
(1) cis-$CH=CH—CH_2—(CH_2)_g—CH_2—$,
(2) cis-$CH=CH—CH_2—(CH_2)_g—CF_2—$,
(3) cis-$CH_2—CH=CH—(CH_2)_g—CH_2—$,
(4) $—(CH_2)_3—(CH_2)_g—CH_2—$, or
(5) $—(CH_2)_3—(CH_2)_g—CF_2—$,
wherein g is one, 2, or 3;
wherein Z_3 is oxa or methylene;
wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



or a mixture of

and
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being

the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro and Z_3 is methylene; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,160,104

ω-ARYL-CIS-13-INTER-OXA-PGE COMPOUNDS

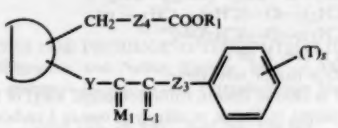
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 774,186, Mar. 3, 1977, which is a division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application May 8, 1978, Ser.J No. 904,187

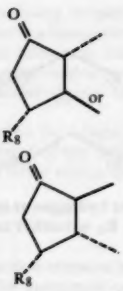
Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—53 **37 Claims**

1. A prostaglandin analog of the formula:



wherein D is



wherein R_8 is hydrogen or hydroxy;

wherein Y is cis-CH=CH-;

wherein Z_4 is

(1) $-CH_2-O-CH_2-(CH_2)_g-CH_2-$,

(2) $-(CH_2)_2-O-(CH_2)_gCH_2-$, or

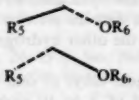
(3) $-(CH_2)_3-O-(CH_2)_g-$,

wherein g is one, 2, or 3;

wherein Z_3 is oxa or methylene;

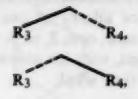
wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein M_1 is

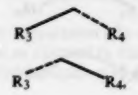


wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro and Z_3 is methylene; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,160,105

ω-ARYL-13,14-DIDEHYDRO-INTER-OXA PGF COMPOUNDS

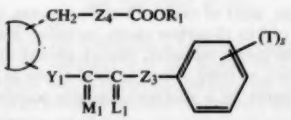
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 776,552, Mar. 7, 1977, which is a division of Ser. No. 657,739, Feb. 13, 1976, Pat. No. 4,029,681. This application Apr. 28, 1978, Ser. No. 901,167

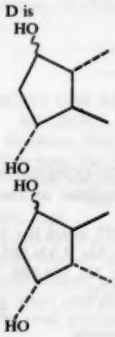
Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—55 **37 Claims**

1. A prostaglandin analog of the formula:



wherein D is



wherein

Y_1 is $-C\equiv C-$;

wherein Z_4 is

(1) $-CH_2-O-CH_2-(CH_2)_g-CH_2-$,

(2) $-(CH_2)_2-O-(CH_2)_g-CH_2-$, or

(3) $-(CH_2)_3-O-(CH_2)_g-$,

wherein

g is one, 2, or 3;

wherein

Z_3 is oxa or methylene;

wherein

T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

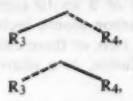
wherein M_1 is

or

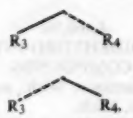
wherein

R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_1 is



or a mixture of



and

wherein

R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro and Z_3 is methylene; and

wherein

R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,160,106

ω-ARYL-CIS-13-INTER-OXA-PGF COMPOUNDS

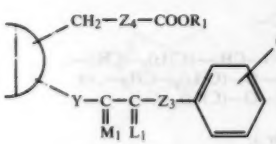
Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 774,186, Mar. 3, 1977, which is a division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application May 8, 1978, Ser. No. 904,186

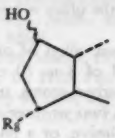
Int. Cl.² C07C *177/00*

U.S. Cl. 560—55 **37 Claims**

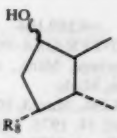
1. A prostaglandin analog of the formula:



wherein D is



or



wherein R_8 is hydrogen or hydroxy;

wherein Y is cis—CH=CH—;

wherein Z_4 is

(1) $—CH_2—O—CH_2—(CH_2)_g—CH_2—$,

(2) $—(CH_2)_2—O—(CH_2)_g—CH_2—$, or

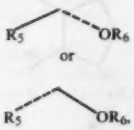
(3) $—(CH_2)_3—O—(CH_2)_g—$,

wherein g is one, 2, or 3;

wherein Z_3 is oxa or methylene;

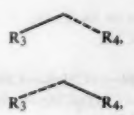
wherein T is chloro, fluoro, trifluoromethyl. alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein M_1 is

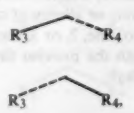


wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other hydrogen or fluoro and Z_3 is methylene; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,160,107
PROCESS FOR THE PREPARATION OF ESTERS OF OXALIC ACID

Giovanni Agnés; Giuseppe Bimbi; Franco Guerrieri, and Guglielmo Rucci, all of Novara, Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 783,047, Mar. 30, 1977, abandoned. This application Sep. 11, 1978, Ser. No. 941,400
Claims priority, application Italy, Apr. 12, 1976, 22169 A/76
Int. Cl.[2] C07C *69/36*
U.S. Cl. 560—204 **12 Claims**

1. Process for the preparation of esters of oxalic acid having the formula ROOC—COOR by oxidative reaction in the presence of palladium-based catalysts, characterized in that the oxalic esters are obtained by the reaction of a copper (II) compound having the formula Cu(OR)X, wherein R represents a radical selected from among alkyls having from 1 to 8 carbon atoms, and X is chosen from between chlorine and bromine atom, with carbon monoxide in the presence of a catalyst selected from the group consisting of Pd salts, metal Pd and zero valent Pd complexes, at a temperature of between 20° and about 200° C., in the absence of O_2.

4,160,108
PROCESS FOR PRODUCING TEREPHTHALIC ACID

Motoo Shigeyasu, and Nobuo Kusano, both of Matsuyama, Japan, assignors to Matsuyama Petrochemicals Inc., Osaka, Japan

Filed Feb. 18, 1977, Ser. No. 770,145
Claims priority, application Japan, Feb. 24, 1976, 51/18421
Int. Cl.[2] C07C *51/33*
U.S. Cl. 562—416 **14 Claims**

1. In a process for producing terephthalic acid which comprises subjecting p-xylene to a liquid-phase oxidation in a lower aliphatic carboxylic acid solvent in the presence of a cobalt compound-manganese compound-bromine or bromine compound catalyst and molecular oxygen, the improvement which comprises

the % by weight based on the weight of said lower aliphatic carboxylic acid solvent of the cobalt component (as cobalt) in the catalyst being within the range of

$$-6.00\times10^{-4}t+1.65\times10^{-1} \text{ to } -2.50\times10^{-3}t+6.25\times10^{-1}$$

wherein t is the reaction temperature of 180° to 225° C.;

the weight ratio of the manganese component (as manganese) in the catalyst to the cobalt component in the catalyst ranges from 0.25:1 to 1:1 and also the amount of the manganese component in the catalyst is 0.05% by weight or less based on the weight of said lower aliphatic carboxylic acid solvent; and

the % by weight based on the weight of said lower aliphatic carboxylic acid solvent of the bromine component (as atomic bromine) in the catalyst is within the range of

$$-4.40\times10^{-3}t+1.08 \text{ to } -1.00\times10^{-2}t+2.50$$

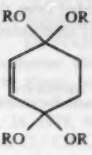
wherein t is as defined above.

4,160,109
CYCLOHEXENE-(1)-DIONE-(3,6)-TETRAALKYLDIKETALS AND PROCESS

Rudolf Pistorius, Ober-Mörlen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

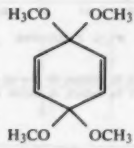
Filed Jan. 26, 1978, Ser. No. 872,450
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703453
Int. Cl.[2] C07C *41/00, 43/00*
U.S. Cl. 568—667 **9 Claims**

1. Cyclohexene-(1)-dione-(3,6)-tetraalkyl diketals of the formula


(II')

wherein each R represents a primary or secondary C_{1-4} alkyl radical.

3. A process for the preparation of a cyclohexene-(1)-dione-(3,6)-tetraalkyl diketal as claimed in claim 1, which comprises reducing p-benzoquinone tetramethyl diketal of the formula



with about 1 mol of hydrogen per mol of diketal in the presence of a hydrogenation catalyst, in a basic medium, at a temperature of from about +10° to +50° C., and optionally reketalizing the cyclohexene-(1)-dione-(3,6)-tetramethyl diketal by treating it with an alcohol having a primary or secondary alkyl moiety of from 2 to 4 carbon atoms, at a temperature of from about −10° to +35° C. in a slightly acidic medium, with substantial exclusion of water.

4,160,110
METHOD FOR STABILIZING BISPHENOLS UNDER MELT OR DISTILLATION CONDITIONS

James C. Carnahan, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 17, 1978, Ser. No. 896,636
Int. Cl.[2] C07C *37/22*
U.S. Cl. 568—703 **8 Claims**

1. A method for stabilizing a bisphenol against decomposition while the bisphenol is in the molten state, or while it is being distilled, which comprises, heating the bisphenol in the presence of an effective amount of stabilizer selected from the group consisting of phthalic anhydride or a phthalic anhydride derivative.

4,160,111
PROCESS FOR RECOVERING PHENOL FROM AQUEOUS PHENOLIC MIXTURES

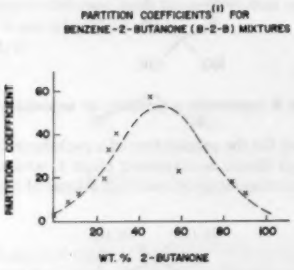
David F. Strahorn, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 27, 1977, Ser. No. 801,440
Int. Cl.[2] C07C *37/38*
U.S. Cl. 568—749 **9 Claims**

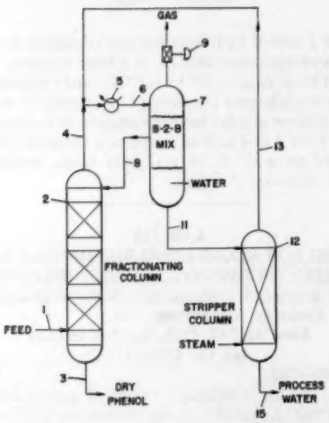
1. In a method for separating phenol from water wherein a phenol-water mixture is distilled in a distillation column to form a liquid fraction comprising phenol and a vapor fraction containing water and phenol in concentrations in accordance with the normal phenol-water azeotrope, the improvement comprising:

fractionating said phenol-water mixture in the presence of an organic mixture comprising a ketone component and a hydrocarbon component, said organic mixture being present at a concentration of from 1 to 20 volumes per volume of water in said phenol-water mixture, said organic mixture including from about 0.1 to 9 parts, by weight, of said ketone component for each part of said hydrocarbon component, said ketone component comprising at least one ketone containing from 3 to 7 carbon atoms, and said hydrocarbon component comprising from about 25 vol-

ume percent to 100 volume percent of at least one aromatic hydrocarbon selected from the group consisting of benzene and lower alkyl substituted benzenes containing



$$(1)\ K = \frac{\text{WT. \% PHENOL IN B-2-B MIXTURES}}{\text{WT. \% PHENOL IN WATER PHASE}}$$



less than 4 alkyl substituent groups and from 0 volume percent to about 25 volume percent of a normally liquid non-aromatic hydrocarbon solvent, whereby the concentration of phenol in said vapor fraction is reduced.

4,160,112

PROCESS FOR THE ISOLATION OF PENTABROMOPHENOL

Robert P. Levek; Rastko I. Mamuzic, and John L. Sands, all of West Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Feb. 13, 1978, Ser. No. 877,189
Int. Cl.[2] C07C *37/38, 39/24*
U.S. Cl. 568—755 **10 Claims**

1. A process for reducing the occurrence of carbonyl-group-containing impurities in pentabromophenol recovered from the reaction mixture of phenol with bromine comprising the steps of:

(a) contacting the reaction mixture comprising crude pentabromophenol with at least one aqueous strong acid selected from the group consisting of hydrochloric acid, phosphoric acid, sulfuric acid, and hydrobromic acid;

(b) applying heat to the mixture resulting from step (a) at temperature of about 40°–160° C. to remove free bromine therefrom by distillation; and

(c) removing pentabromophenol from the mixture resulting from step (b).

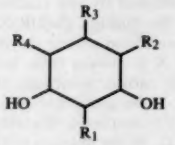
4,160,113

PROCESS FOR THE MANUFACTURE OF RESORCINOL

Werner H. Müller, Kelkheim; Knut Riedel, Hofheim, and Hans Krekeler, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

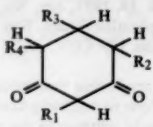
Continuation of Ser. No. 602,028, Aug. 5, 1975, abandoned. This application Nov. 11, 1977, Ser. No. 850,815
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1974, 2437983
Int. Cl.[2] C07C *39/08*
U.S. Cl. 568—772 **7 Claims**

1. A process for making a resorcinol having the formula



wherein R_1 to R_4 are members selected from the group consisting of H, straight-chain, branched chain, cyclic alkyl, each having up to 12 carbon atoms, phenyl and naphthyl,

which comprises catalytically dehydrogenating in liquid phase a cyclohexane dione-(1,3) of the formula



wherein R_1 to R_4 have the above-mentioned meaning;

by adding said cyclohexane dione-(1,3) to a solvent mixture consisting essentially of a solvent selected from the group consisting of diethylene glycol dialkyl ether, triethylene glycol dialkyl ether and tetraethylene glycol dialkyl ether, wherein said alkyl contains up to 6 carbon atoms and a catalyst selected from the group consisting of palladium, platinum, ruthenium and rhodium;

catalytically dehydrogenating said cyclohexane dione-(1,3) at about atmospheric pressure and a temperature of from 180° to 260° C., controlling the concentration of said cyclohexanone dione-(1,3) at no more than 30% by weight, based on weight of the liquid phase; and separating and recovering said resorcinol.

4,160,114

CO-CATALYTIC METHOD FOR OBTAINING IMPROVED CHLORINATION OF PHENOLS

Frederic J. Shelton, Tacoma; William H. Wetzel, Federal Way; John E. Wilkinson, Gig Harbor, and Robert J. Goodwin, Puyallup, all of Wash., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed Jul. 20, 1977, Ser. No. 817,439
Int. Cl.[2] C07C *39/36, 37/00*
U.S. Cl. 568—776 **7 Claims**

1. In a process for producing relatively pure commercially acceptable pentachlorophenol, comprising reacting at a temperature ranging from about 10° to about 190° C., (A) a phenol which is at least one member selected from a group consisting of phenol and lower chlorophenols and mixtures thereof, and (B) chlorine, in the presence of (C) an acid catalyst from about 0.005 moles to about 0.016 moles per mole of (A) used, consisting essentially of aluminum chloride, ferric chloride, metal iron, aluminum tris-butoxide, antimony chloride, metallic antimony, stannous chloride, metallic tin, cuprous chloride and metallic copper; the improvement consisting of using (D) a sulfur containing co-catalyst selected from the group consist-

ing of sulfur thiophenol, para-chlorothiophenol, para, para'-dichlorophenyl sulfide, sodium hydrosulfide, 2,2'-thiobis (4,6-dichlorophenol) benzyl disulfide, dibenzothiophenol, benzyldisulfide, diphenyl sulfide, diphenyl disulfide, di-isopentyl sulfide, naphthalene thiol, heptyl sulfide, hexochlorophenyl sulfide, dicresyl disulfide, dihexadecyl sulfide and dibenzothiophenol thiophenol, wherein components (A) and (B) constitute the sole reacting ingredients and components (C) and (D) constitute the catalytic system for promoting the reaction of components (A) and (B).

4,160,115

PROCESS FOR THE MANUFACTURE OF BUTENEDIOL

Charles H. Vasey, and Dhafir Y. Waddan, both of Middlesbrough, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sep. 5, 1978, Ser. No. 939,917

Claims priority, application United Kingdom, Sep. 22, 1977, 39533/77; Jan. 23, 1978, 2600/78

Int. Cl.[2] C07C *31/18*

U.S. Cl. 568—857 **10 Claims**

1. A process for the manufacture of 2-butene-1,4-diol which comprises reacting butadiene with water and oxygen in the presence of a copper, nickel, cobalt, chromium, manganese or molybdenum catalyst.

4,160,116

PROCESS FOR THE PRODUCTION OF ALKYLENE GLYCOLS

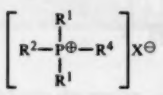
Michihiro Mieno, Yokohama; Hideki Mori, Kawasaki; Jun Nakanishi, and Juichi Kasai, both of Tokyo, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Aug. 28, 1978, Ser. No. 937,460

Int. Cl.[2] C07C *29/00*

U.S. Cl. 568—867 **9 Claims**

1. A process for the production of an alkylene glycol, in which the hydration of an alkylene oxide is carried out at a temperature of from 50° C. to 200° C. in the presence of 0.05 to 1.0 mole, per mole of alkylene oxide, of carbon dioxide and in the presence of, as a catalyst, a quaternary phosphonium salt of the formula



wherein R^1, R^2, R^3 and R^4, independently from each other, represent an alkyl, alkenyl or aryl group, and X represents an iodine, bromine or chlorine atom.

4,160,117

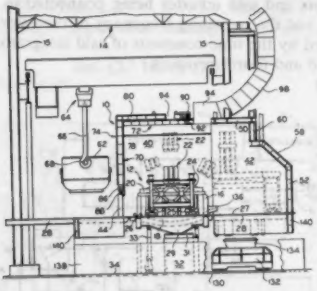
ARC FURNACE ENCLOSURE

Eberhard G. Schempp, 115 Kinross La., Pittsburgh, Pa. 15237

Filed Oct. 12, 1977, Ser. No. 841,344

Int. Cl.[2] F27D *23/00*

U.S. Cl. 13—1 **4 Claims**



1. An enclosure for a tiltable electric arc furnace having a furnace body and a cover swingable from a position above the furnace body to a remote position to permit the charging of materials into said furnace body, electrode means extending through said cover and swingable therewith, said enclosure including:

front, side and rear walls and a roof,

a tiltable platform within said enclosure and disposed adjacent said front wall for supporting said furnace, said furnace roof being adjacent said rear wall in its remote position,

a first opening in said front wall to permit the movement of a charging vessel into and out of said enclosure,

a second opening in said roof above said furnace body and exposing a major portion of said furnace body and cover to permit the passage of ladle support means into and out of the enclosure, said second opening also permitting access to furnace electrodes and associated circuitry,

door means for closing said first and second openings, means for supporting said door means for movement between a closed position relative to said openings and an open position wherein said openings are exposed, said door means including a vertical portion for closing said first opening and a generally horizontal top portions for covering a major portion of said second opening,

said top door portion being shaped such that when it is in its closed position a third opening is defined above said furnace to permit a ladle support means to extend therethrough when said door means is closed, and air curtain means disposed adjacent said third opening for directing air thereacross for sealing the same, and vent means opening into said enclosure roof for removing gases therefrom.

4,160,118

METHOD AND APPARATUS FOR SUPERHEATING GASES

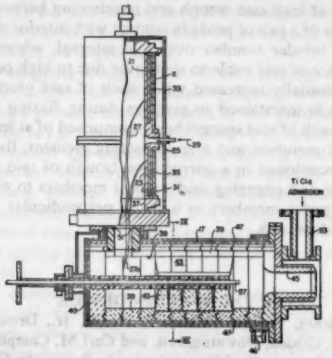
Maurice G. Fey, Plum Boro, and Charles B. Wolf, Irwin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 837,655, Sep. 29, 1977. This application Feb. 27, 1978, Ser. No. 881,350

Int. Cl.[2] H05H *1/00;* **H05B** *7/00*

U.S. Cl. 13—2 P **7 Claims**

1. An arc heater system as a high energy heat source for producing metal oxide, comprising a housing forming a mixing compartment, a plurality of arc heaters mounted on the housing and extending substantially radially thereon, each arc heater comprising a downstream electrode adjacent to the housing and an upstream electrode remote therefrom, the upstream and downstream electrodes having a gap therebetween, each arc heater having an arc chamber communicating with the compartment, a reactor communicating with the downstream end of the mixing compartment, inlet means at the downstream end of the compartment for introducing an oxidizable metal compound into the reactor, and the reactor being axially aligned with the compartment.



4,160,119

HIGH VOLTAGE ELECTRICAL CABLES

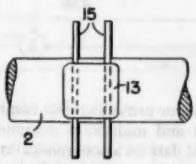
Jan Artbauer, Langenhagen, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshuette AG, Fed. Rep. of Germany

Continuation of Ser. No. 270,585, Jul. 11, 1972, abandoned. This application Oct. 24, 1975, Ser. No. 625,583

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1972, 2134888

Int. Cl.[2] H01B *9/04, 17/58*

U.S. Cl. 174—28 **2 Claims**



1. A high voltage cable comprising:

an inner elongated conductor;

a tubular member encompassing and continuously disposed about said inner conductor, said tubular member having a diameter exceeding that of said inner elongated conductor and at least a portion thereof corrugated to exhibit enhanced flexibility, said corrugated portion including a plurality of adjacent ridges and furrows characterized by a longitudinal cross-section displaying a regular and periodic deformation pattern in the form of a plurality of adjacent peaks and troughs; and

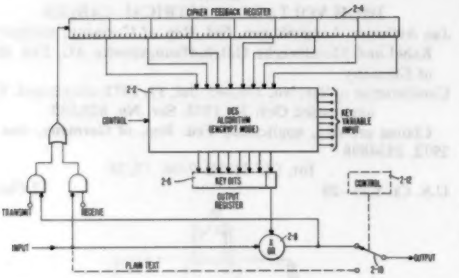
a plurality of spacers positioned along the longitudinal axis of said high voltage cable formed and extending between said inner conductor and said tubular member through an insulating environment, wherein said spacers have surfaces adjacent said inner conductive member which comprise conductive materials and wherein the remaining portions of such spacers are substantially non-conductive, said plurality of spacers each having a surface portion thereof in contact with an interior surface of said tubular member, said contacting surface portion of each of said plurality of spacers being configured to substantially follow an interval of the profile of said corrugated portion which includes at least one trough and portions of a pair of peaks adjacent to said at least one trough, said contacting

surface portion of each spacer thereby extending across an interval of the profile of said corrugated portion occupied by said at least one trough and terminating between said portions of a pair of peaks in contact with interior surfaces of said tubular member over said interval, whereby the resistance of said cable to sparkover due to high potential is substantially increased while each of said plurality of spacers is maintained in position during flexing of said cable, each of said spacers being comprised of at least two support members and a spring-acting element, the latter being positioned in a corrugation trough of said tubular member and engaging said support members to maintain said support members in a plane perpendicular to said longitudinal axis.

4,160,120
LINK ENCRYPTION DEVICE

Vera L. Barnes, Wayne; Thomas J. Dodds, Jr., Drexel Hill; Harold F. Gibson, Downingtown, and Carl M. Campbell, Jr., Newtown Square, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 17, 1977, Ser. No. 852,443
Int. Cl.[2] H04L *9/00*
U.S. Cl. 178—22 **26 Claims**



1. An apparatus for providing data communications security in point-to-point and multipoint communications networks, wherein plain text data on a communications line is enciphered on a bit-by-bit basis when received from said communications line, comprising:

means for receiving said plain text data from said communications line on a bit-by-bit basis;

means for generating a plurality of key bits for each bit of said plain text data received from said communications line;

means for storing said plurality of key bits;

means for exclusive ORing each bit of said plain text data with one of said plurality of key bits generated for the bit previous to each of said bits of plain text data, whereby a bit of enciphered data is produced corresponding to each of said bits of plain text data; and

means for transmitting each of said bits of enciphered data onto said communications line, whereby each of said bits of plain text data is replaced by the corresponding bit of reciphered data.

4,160,121
FREQUENCY SHIFT KEYED TONE GENERATOR

Barry M. Kaufman, Pine Brook, N.J., assignor to RFL Industries, Inc., Boonton, N.J.

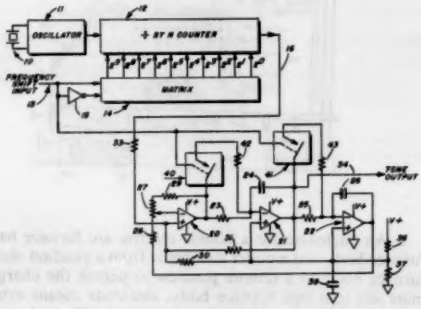
Filed Jan. 5, 1977, Ser. No. 756,996
Int. Cl.[2] H04B *1/04*
U.S. Cl. 178—66 A **1 Claim**

1. A frequency shift keyed tone generator for providing an output tone frequency in response to an applied control signal, said generator comprising,

a—a digital frequency synthesizer whose output is programmable to any one of a plurality of tone frequencies in respose to said control signal,

b—a tracking active bandpass filter driven by the output of the synthesizer and comprising a pair of operational integrators each having a resistor establishing the time constant thereof, and an operational phase inverter, said integrators and said inverter being connected in a feedback loop and the operating frequency of the filter being controlled by the time constants of said integrators,

c—third and fourth resistors,



d—a first switch controlling the connection of said third resistor to the resistor of one of said pair of integrators to change the time constant thereof,

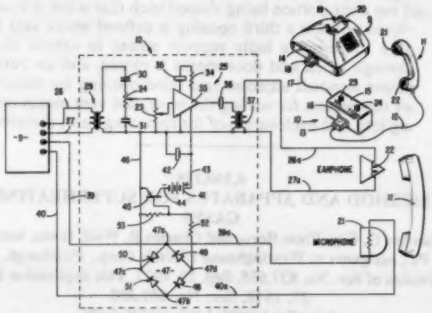
e—a second switch controlling the connection of said fourth resistor to the resistor of the other of said pair of integrators to change the time constant thereof, and

f—means applying the said control signal simultaneously to the first and second switches, the arrangement being such that the operating frequency of the filter corresponds to the output frequency of said synthesizer.

4,160,122
TELEPHONE EARPHONE AMPLIFIER

Sava W. Jacobson, 8130 Orion Ave., Van Nuys, Calif. 91406

Filed May 23, 1978, Ser. No. 908,589
Int. Cl.[2] H04M *1/60*
U.S. Cl. 179—1 A **7 Claims**



1. For use with a telephone instrument of the type having a handset with an earphone and a microphone, an earphone amplifier system comprising:

an amplifier connectable in circuit with said earphone to amplify the audio signal going to said earphone,

a source of power for said amplifier, and

switch means, actuated by the dc bias supplied to said microphone from the telephone line when the handset is taken off-hook, for connecting said source of power to said amplifier so long as said handset is off-hook.

4,160,123

METHODS OF AND APPARATUS FOR THE ENCODED TRANSMISSION OF INFORMATION

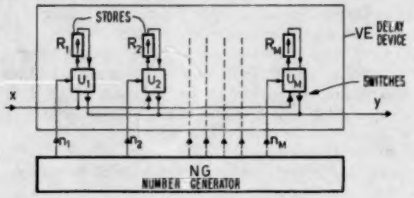
Gustav Guanella, Zurich, and Alban Graf, Gebenstorf, both of Switzerland, assignors to Patelhold Patentverwertungs- & Elektro-Holding AG, Glarus, Switzerland

Filed Feb. 2, 1976, Ser. No. 654,373

Claims priority, application Switzerland, Feb. 26, 1975, 2432/75

Int. Cl.[2] H04K *1/06*

U.S. Cl. 179—1.5 R 54 Claims



1. A method for coded transmission of data comprising the steps of:

(A) at a transmitting station including first and second memories each having a plurality of storage locations;

(1) dividing a signal to be transmitted into a succession of discrete message elements of equal length;

(2) generating a first set of age signals in a random fashion wherein each of said age signals are chosen from the real integers n = 0, 1, 2, 3, . . . , N, one of said age signals being generated during each of a plurlity of successive time periods;

(3) storing a different one of said message elements in said first memory each time a new random age signal is generated, the memory location into which a message elememt is stored during any given time period being determined by the value of the random age signal generated during said given time period;

(4) assigning a predetermined age number to each said message element as said message element is placed in storage and storing said assigned age numbers in a second memory, said predetermined age number being integer and indicating that the message element to which it has been assigned has just been placed in storage;

(5) altering the value of each of said stored age numbers by one integer during each of said successive time periods whereby the instantaneous value of each of said stored age numbers indicates the number of said time periods its respective message element has been in storage,

(6) comparing said stored age numbers with said random age signals and transmitting a different one of said stored message elements during each of said time periods, the message element transmitted during any given time period being that message element whose corresponding age number is equal to the random age signal generated during said given time period;

(7) said step of storing said message elements in a storage location determined by the value of the random age signal generated during any given time period comprising the step of storing the next occurring discrete message element in the storage location of said first memory previously occupied by the message element most recently transmitted;

(B) at a receiving station including third and fourth memories each having a plurality of memory locations;

(1) generating a second set of random age signals at said receiver, said second set of random age numbers being identical in sequence and frequency to said first set of random age numbers;

(2) receiving said transmitted message element in the same sequence in which they are transmitted;

(3) storing each of said received message elements in said third memory in the order in which said message elements are received;

(4) assigning an age number to each message element as it is stored in said third memory, the age number assigned to a message element stored in said third memory during any given time period being equal to the value of the random age signal generated during said given time period whereby the age number initially assigned to each message element stored in said third memory indicates the number of time periods said message element was stored at said transmitter;

(5) storing said assigned age numbers in said fourth memory;

(6) alternating each of said age numbers stored in said fourth memory by one integer in the same sense as the age numbers stored in said second memory are being altered such that the instantaneous value of each of said age numbers stored in said fourth memory is indicative of the total amount of time its corresponding message element has been in storage; and

(7) reading the message element whose corresponding age number reaches a predetermined value out of said third memory such that the message elements are read out of said third memory in the same order as they are read into said first memory.

4,160,124

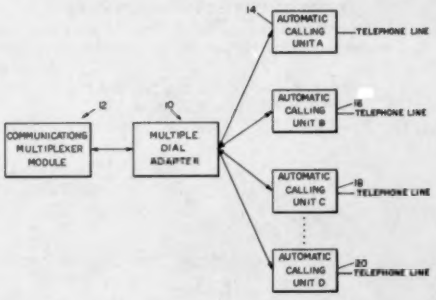
MULTIPLE DIAL ADAPTER

Wendell A. Law, Kaysville, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 31, 1977, Ser. No. 801,988

Int. Cl.[2] H04M *11/00*

U.S. Cl. 179—2 DP 6 Claims



1. A multiple dial adapter to interface between a communications multiplexer module and a plurality of automatic calling units connected to an equal plurality of telephone lines, said module being programmed to generate a coded command specifying which one of said units is to perform a telephone number dialing operation and then to successively generate a coded command specifying the telephone number said unit is to dial, said adapter comprising:

decoder means connected to said module for receiving said coded commands from said module and decoding the same to provide unit selecting and dialing instructions;

a plurality of interfaces, each connected with one of said units for receiving and presenting the status of said unit and for transferring dialing instructions thereto for performance of a telephone number dialing operation by said unit;

selector means connected to said decoder means and to each of said interfaces, said selector means being initially set in a cleared condition for receiving a unit selecting instruc-

tion from said decoder means and interrogating the status of a selected one of said units presented on said one of said interfaces connected to said selected one unit, said selector means capable of switching to an active condition in communication with said selected one of said units through its associated interface if the status of said selected unit is presented as being set for performance of a dialing operation; and

generator means connected to said selector means and to said module for receiving from said selector means the status of said selected unit as presented by its associated interface to said selector means, interpreting said received status, and generating a code to said module for instructing said module as to said status of said selected unit in response to each coded command generated by said module to said decoder,

said selector means when switched to said active condition being capable of successively receiving from said decoder means said dialing instructions corresponding to consecutive digits of the telephone number to be dialed and of transferring the same to said selected unit through its associated interface for performance of the dialing operation on said transferred instructions, said selector means further capable of interrogating the status of said selected unit presented by its associated interface to said selector means after the performance of the dialing operation on each transferred instruction;

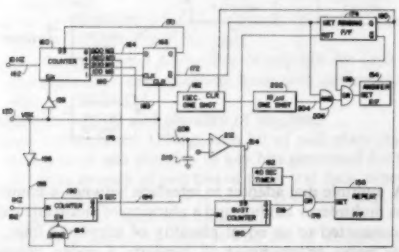
said generator means receiving from said selector means the status of said selected unit after the performance of the dialing operation on each transferred instruction and, if the status is interpreted by said generator means as a request to present the next digit, said generator means then generates a code to said module instructing the same to send the coded command representing the next digit of the telephone number to said decoder means.

4,160,125

TELEPHONE POLLING APPARATUS

David S. Bower, Sunrise, and Fred J. Smith, Plantation, both of Fla., assignors to Digital Products Corporation, Fort Lauderdale, Fla.

Filed May 23, 1977, Ser. No. 799,141
Int. Cl.[2] H04M *3/46, 3/50*
U.S. Cl. 179—6 D **8 Claims**



1. Apparatus for sending and receiving messages on a telephone line comprising:

means for generating a start signal;

dialing means responsive to said start signal for providing dial signals indicative of a telephone number to said telephone line and a number complete signal upon completion of said providing;

means rendered effective by said number complete signal and responsive to energy on said telephone line for providing a first signal in response to an energy condition on said telephone line indicative of an answer condition, and for providing a second signal in response to an energy condition on said telephone line indicative of a response condition other than said answer condition;

means responsive to said first signal for transmitting a prerecorded message over said telephone line;

means responsive to the end of said prerecorded message for generating an end of message signal;

selectable switching means, connected to said end of message signal generating means, for conveying said end of message signal to a selected one of a first or a second terminals;

means responsive to said end of message signal being at said first terminal for generating a third signal;

means responsive to said end of message signal being at said second terminal for coupling one or more recording means to said telephone line, and response timer means connected to said coupling means for timing a predetermined interval upon the occurrence of said end of message signal at said second terminal and for generating a fourth signal at the termination of said predetermined interval;

and means responsive to any of said second, third, or fourth signals for actuating said start signal generating means.

4. Apparatus for supplying a prerecorded message to a telephone line comprising:

means for storing a telephone number to be called;

means for generating a start signal;

dialing means responsive to said start signal for providing dial signals indicative of a telephone number to said telephone line and a number complete signal upon completion of said providing, said dialing means including a counter, means for setting said counter with a digit of said telephone number, said counter setting means including a shift register having a leading end and a trailing end, the number of bit positions in said shift register being one more than the maximum number of digits to be dialed, means for inserting in said shift register a plurality of consecutive ONES starting at said leading end, the number of said ONES equaling the difference between the number of shift register bit positions and the number of digits of the telephone number to be called, means for scanning said shift register bit positions starting at the leading end, means for inserting into said counter the digits of the telephone number in sequence in synchronism with the scanning of said shift register whenever a ONE is detected in a bit position of said shift register, means for decrementing said counter, means responsive to said counter being decremented for generating a dial pulse, and means responsive to said counter reaching a count of zero for terminating said dial pulse generating;

means responsive to said number complete signal for incrementing the stored telephone number by a predetermined number;

means rendered effective by said number complete signal and responsive to energy on said telephone line for providing a first signal in response to an energy condition on said telephone line indicative of an answer condition, and for providing a second signal in response to an energy condition on said telephone line indicative of a response condition other than said answer condition;

means responsive to said first signal for transmitting said prerecorded message over said telephone line;

means responsive to the end of said prerecorded message for generating a third signal; and

means responsive to either said second signal or said third signal for actuating said start signal generating means.

4,160,126

MODULAR MULTIPLEX/DEMULTIPLEX APPARATUS

Robert J. Bojanek, Newton, and Marvin S. Mason, Lexington, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 1, 1978, Ser. No. 901,928
Int. Cl.[2] H04J *3/02*
U.S. Cl. 179—15 AT **6 Claims**

1. A modular multiplex/demultiplex apparatus comprising:

a plurality of multiplex/demultiplex module units arranged in series in a group and each comprising:

a plurality of multiplex input lines each adapted to receive a multiplexed signal thereon, the multiplexed signal on each line being in a serial bit format;

shift register means comprising a plurality of stages connected in series;

selection circuit means operative to cause a selected one of the multiplexed signals on the multiplex input lines to be transferred to the shift register means;

said shift register means being operative to shift bits of the multiplex signal transferred thereto serially along the stages thereof and to be stored in succession in said stages;

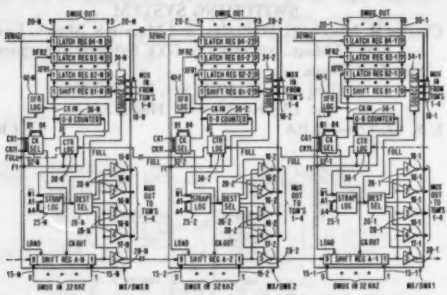
counter means operative to count the bits shifted into and stored in the shift register means and when the count reaches a predetermined value to produce an output count signal;

storage means having a plurality of storage locations each coupled to a corresponding one of the plurality of stages of the shift register means;

counter circuit means coupled to the counter means, to the shift register means and to the counter circuit means of the next succeeding module unit in the series;

designation means designating the counter circuit means as the first counter circuit means of the series of module units or as other than the first counter circuit means of the series;

said counter circuit means being operative when designated by the designation means as the first counter



circuit means in the series of module units and, in response to the counter means producing an output count signal, to produce and apply a transfer signal to the storage means and to produce and apply a full output signal to the counter circuit means of the next succeeding module unit in the series, and said counter circuit means being operative when designated by the designation means as other than the first counter circuit means in the series of module units and, in response to a full output signal from the counter circuit means of the preceding module unit in the series, to produce and apply, upon the occurrence of the next output count signal of the counter means following the receipt by the counter circuit means of the full output signal, a transfer signal to the storage means and a full output signal to the counter circuit means of the next succeeding module unit in the series;

the storage means of each module unit being operative in response to a transfer signal being received thereby to receive the bits of data then stored in the associated shift register means and to store said bits of data in the storage locations thereof in a demultiplexed format;

a plurality of demultiplex output lines each coupled to a different one of the storage locations of the storage means; and

readout means operative to cause the data stored in the storage means to be applied in parallel to the demultiplex output lines.

4,160,127

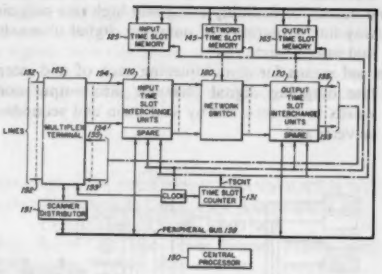
TIME-SLOT INTERCHANGE WITH PROTECTION SWITCHING

Matthew F. Slana, Naperville, Ill., and Henry E. Vaughan, deceased, late of Whispering Pine, N.C. (by Emily Heiland Vaughan, executrix), assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 27, 1978, Ser. No. 919,444

Int. Cl.[2] H04J *3/00*

U.S. Cl. 179—15 AQ **9 Claims**



1. A communications switching system comprising a switching network, a group of line interface units connected to said network, a corresponding group of communication lines connected to said interface units, a plurality of time-slot memories associated with said line interface units for controlling the transfer of data through said line interface units, and error detection circuits for detecting faults in said line interface units and for generating error signals indicative of a fault in an identifiable interface unit of said group of units;

CHARACTERIZED IN THAT

said system comprises a spare interface unit connected to all lines of said group of lines, a time-slot memory associated with said spare interface unit for controlling the transfer of data through said spare interface unit, and circuit means responsive to said error signals for transferring data between said spare unit and a line connected to a unit of said group of units identified by said error signals and for transferring information from a time-slot memory associated with the interface unit identified by said error signals to the time-slot memory associated with said spare line interface unit.

4,160,128

DIGITAL DATA TRANSMISSION SYSTEM PROVIDING MULTIPOINT CONNECTIONS

Alain G. Texier, 32, avenue de General de Gaulle, 92360 Meudon-La-Foret, France

Continuation-in-part of Ser. No. 781,296, Mar. 25, 1978, abandoned. This application Jun. 23, 1978, Ser. No. 918,429

Int. Cl.[2] H04J *3/02*

U.S. Cl. 179—15 BA **4 Claims**

1. A digital transmission system providing multipoint connections in which a main data transceiver can communicate with a plurality of secondary data transceivers and the secondary data transceivers can each, in turn, communicate with the main data transceivers, transmission occuring via component digital words at low rates which are different from but multiples of one another, said digital transmission system comprising:

first means for multiplexing input component words transmitted by said main and secondary transceivers into incoming digital channels having an intermediate rate, with periodicities equal to the respective ratios of said intermediate rate to said low rates, said multiplexed input component words forming in each said incoming channel a multiframe respectively and the positions of said input words in a multiframe being given by a first partial address in said

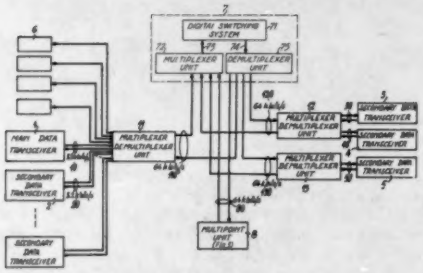
first multiplexing means and being selectively assigned to said main and secondary transceivers;

second means for multiplexing a plurality of said intermediate rate incoming digital channels into an incoming highway having a high rate, said input words being given by a second partial address in said second multiplexing means;

means for selectively switching said input component words from said high rate incoming highway to output word positions in an outgoing highway having said high rate according to said first and second partial addresses thereof;

first means for demultiplexing said high rate outgoing highway into a plurality of outgoing digital channels having said intermediate rate;

second means for demultiplexing each of said intermediate rate outgoing digital channels into output component words to be received by said main and secondary transceivers; and



a multipoint unit connected to said switching means by said second multiplexing means and first demultiplexing means via an outgoing digital channel and an incoming digital channel having said intermediate rate, said multipoint unit including means for simultaneously transferring the input words assigned to the main transceiver of each of said multipoint connections on said intermediate rate incoming digital channel to output word positions assigned to the secondary transceivers of said multipoint connection on said intermediate rate outgoing digital channel and means for sequentially transferring the input words assigned to the secondary transceiver of said multipoint connection which communicates with said main transceiver on said intermediate rate incoming digital channel to output word positions assigned to said main transceiver on said intermediate rate outgoing digital channel.

4,160,129
TELEPHONE COMMUNICATIONS CONTROL SYSTEM HAVING A PLURALITY OF REMOTE SWITCHING UNITS

Alan Peyser, McLean, Va., and William Von Meister, Silver Spring, Md., assignors to TDX Systems, Inc., Vienna, Va.

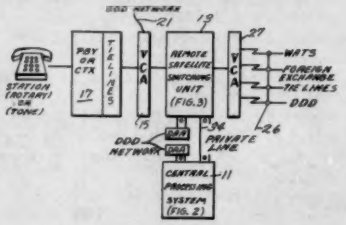
Filed May 3, 1977, Ser. No. 793,428
Int. Cl.[2] H04M *3/42*; H04Q *3/58*
U.S. Cl. 179—18 E **11 Claims**

1. A telephone communication lines control system for controllably connecting local subscriber telephone units to long distance lines comprising:

a plurality of remote switching means for connecting local subscriber telephone units to selected long distance telephone lines;

a central control means positioned at a location remote from said switching means for controlling the connection of said local subscriber telephone units to said long distance telephone lines at each of said plurality of remote switching means, said central control means including means for selecting said long distance lines with a predetermined priority for each of a plurality of said subscriber telephone units; and

means for interconnecting said central control means to said plurality of remote switching means, said interconnecting means transmitting data signals between said remote

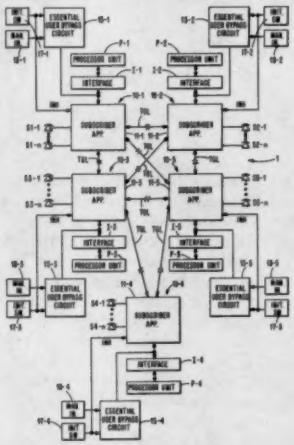


switching means and said remotely positioned central control means wherein voice communications signals being transmitted by said local subscriber telephone units are connected to selected long distance lines at said remote switching means without being connected through said remotely positioned control means.

4,160,130
ESSENTIAL USER BYPASS CIRCUIT FOR TELEPHONE SWITCHING SYSTEM

Charles R. Marchetti, Wellesley, and Marvin S. Mason, Lexington, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jun. 20, 1978, Ser. No. 920,946
Int. Cl.[2] H04M *3/42*; H04Q *3/42*
U.S. Cl. 179—18 EA **7 Claims**



1. A switch unit for a telephone system for establishing connections between telephone subscribers assigned to the switch unit and subscribers assigned to other switch units, said switch unit being adapted to be interconnected with other switch units by trunk lines, said switch unit comprising:

subscriber subsets for initiating call operations;

subscriber apparatus means coupled to the subscriber subsets and to trunk lines to other switch units, said subscriber apparatus means having an address input for receiving address signals relating to call processing operations initiated by subscribers assigned to the switch unit, said subscriber apparatus means being operative in response to address signals received at its address input to establish

connections between subscribers assigned to the switch unit or between subscribers assigned to the switch unit and trunk lines to other switch units; and

essential user bypass means coupled to the address input of the subscriber apparatus means and adapted to store a predetermined number of address signals specifying connections between preselected ones but less than all of the subscribers assigned to the switch unit and trunk lines to other switch units, each of said address signals including a first address portion identifying a particular one of the preselected subscribers and a second address portion identifying a particular trunk line, said essential user bypass means being adapted to be enabled to supply the address signals stored therein to the address input of the subscriber apparatus means in place of address signals applied to the address input prior to the enablement of the essential user bypass means; and

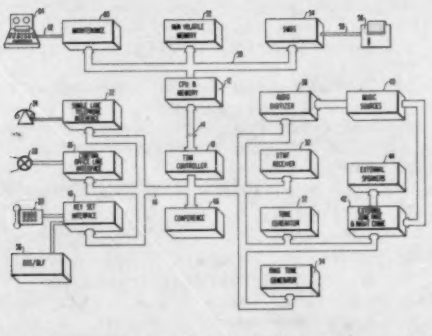
said subscriber apparatus means being operative in response to address signals received at its address input from the essential user bypass means to establish connections between the preselected ones of the subscribers assigned to the switch unit and trunk lines to other switch units as specified by the address signals.

4,160,131

ELECTRONIC KEY TELEPHONE SYSTEM

Pradeep P. Kaul; Thomas H. Scholl, both of Rockville; Deepak R. Muzundar, Gaithersburg; Daniel R. Wendling, Gaithersburg; Bob D. Buschman, Gaithersburg, all of Md.; Michio Ikawa; Akira Miura, both of Tokyo, Japan, and David A. Love, Silver Spring, Md., assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Oct. 7, 1977, Ser. No. 840,451
Int. Cl.[2] H04Q *5/20*
U.S. Cl. 179—99 M **30 Claims**



1. A telephone exchange for selectively connecting a plurality of telephones to a plurality of telephone lines, said telephone exchange comprising:

a plurality of interface units, at least one of which is a key-set telephone interface unit for connection to a plurality of key-set telephones,

a TDM bus for carrying time division multiplexed digital data, according to a first frame format, between said interface units,

TDM controller means connected to said interface units for controlling the access of said interface units to said TDM bus and for controlling the frame format of the digital data on said TDM bus,

each said key-set telephone being respectively connected to said key-set telephone interface by means of a receiving wire pair and a transmitting wire pair for carrying digital data according to a second frame format, said digital data on said receiving wire pair provided by said key-set telephone interface and including multiplexed digitally encoded audio signals and digital control data, said digital data on said transmitting wire pair provided by said key-set telephone and including multiplexed digitally encoded audio signals and digital request data,

encoding means for digitally encoding audio signals,

means for connecting said digitally encoded audio signals onto said transmitting wire pair,

means for decoding digitally encoded audio signals received on said receiving wire pair,

means for generating digital request data representing selectable functions of said key-set telephone,

means responsive to a digital scan code received via said receiving pair of wires from said key-set interface unit for transmitting said digital request data to said key-set interface unit by multiplexing same with said digitally encoded audio signals onto said transmitting wire pair, and

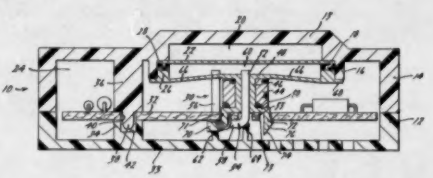
said key-set telephone interface unit comprising means for synchronizing the said second frame rate with the first frame rate.

4,160,132

ELECTROMAGNETIC ACOUSTIC TRANSDUCER WITH ITS AIR GAP ESTABLISHED AT ASSEMBLY BY COUNTERACTING SPRINGS

Irvin B. Rea, Royal Oak, and Juhan Telmet, Fraser, both of Mich., assignors to Lectron Products, Inc., Troy, Mich.

Filed Jun. 20, 1978, Ser. No. 917,174
Int. Cl.[2] H04R *13/00*
U.S. Cl. 179—114 R **17 Claims**



1. In a tone generator of the type having a housing provided with primary and secondary sound cavities and an annular seat at the juncture of said cavities,

a diaphragm separating said cavities disposed with the peripheral marginal portion thereof supported by said annular seat, and

retaining means overlaying the marginal portion of said diaphragm and said seat, the improvement comprising

mounting means in said secondary sound cavity including a board element connected to said housing and positioned thereby a pedetermined distance from said diaphragm, and

electromagnetic means for vibrating said diaphragm carried by said mounting means, said electromagnetic means including a bobbin disposed between said diaphragm and said board element and detachably fastened to the latter, and a pole piece extending through said bobbin and engaging said board element to locate an end of said pole piece spaced precisely a predetermined distance from said diaphragm, and

resilient means interconnecting said bobbin and said retaining means adapted to be flexed automatically at assembly of said tone generator, flexure of said resilient means urging said retaining means toward said seat whereby to clamp and hold the marginal portion of said diaphragm and simultaneously holding the bobbin in secure engagement with said board.

11. In a tone generator of the type having a housing formed by interconnected case and cover portions and provided with primary and secondary sound cavities separated by a diaphragm, the improvement comprising

mounting means detachably held between cooperating portions of said case and said cover and disposed thereby in predetermined spaced relation with respect to said diaphragm,

electromagnetic means including a bobbin and a pole piece, said bobbin being detachably fastened to said mounting means and having diaphragm retaining means associated therewith adapted to move automatically at assembly into operative clamping association with said diaphragm,

said pole piece engaging said mounting means and positioned by the latter precisely in predetermined spaced relation with respect to said diaphragm, and

resilient means interacting between said housing and said pole piece holding the latter in engagement with said mounting means and in precise spaced relation with respect to said diaphragm.

13. In a tone generator of the type having a housing,

a diaphragm in said housing defining separate primary and secondary sound cavities at opposite sides thereof,

mounting means in said secondary sound cavity, and

electromagnetic means carried by and detachably fastened to said mounting means, said electromagnetic means including a bobbin and a pole piece and being disposed with said pole piece in operative association with said diaphragm to vibrate the latter, the improvement comprising

counteracting spring means associated with said bobbin and said pole piece, respectively,

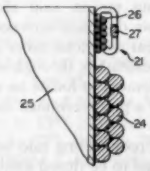
one of said spring means coacting with and acting through said bobbin to hold said electromagnetic means securely assembled with said mounting means,

the other of said spring means coacting with said pole piece to hold the latter spaced a predetermined distance from said diaphragm to assure a desired quality of sound from the vibration of said diaphragm.

4,160,133
MOVING VOICE COIL LOUDSPEAKER WITH MAGNETIC DAMPING INCREASING AT LARGE EXCURSIONS

Tore H. Wiik, Verlegt. 46, N-1500 Moss, Norway

Filed Mar. 1, 1978, Ser. No. 882,464
Claims priority, application Norway, Mar. 1, 1977, 770687; Aug. 16, 1977, 772855
Int. Cl.[2] H04R *9/02, 9/06*
U.S. Cl. 179—115.5 VC **5 Claims**



1. An electrodynamical loudspeaker comprising:

a voice coil;

a diaphragm to which said voice coil is fixed,

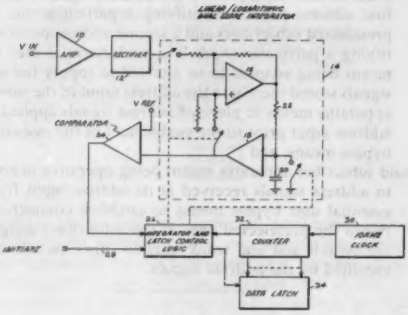
a magnet system having an air gap in which said voice coil is resiliently suspended for oscillatory movement to either side from a neutral position, and a short-circuit ring at least one end of said voice coil,

wherein said short-circuit ring is disposed in such a position relative to a central portion of said voice coil that it is located outside the air gap of said magnet system when said voice coil is in its neutral position.

4,160,134
DIGITAL SIGNAL LEVEL MEASUREMENT

James C. Carroll, Apex, N.C., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 25, 1977, Ser. No. 827,508
Int. Cl.[2] H04B *3/46;* H03K *13/02*
U.S. Cl. 179—175.3 R **15 Claims**



1. An instrument for measuring the level of an input ac electrical signal comprising:

rectification means having said ac input signal coupled thereto for deriving a dc voltage having an amplitude which is substantially linearly proportional to the RMS value of said input ac signal;

means for providing a reference voltage;

integration means having said dc voltage coupled thereto to derive an exponentially decaying integration voltage wherein said integration means comprises a dual slope integrator for generating a ramp voltage having a rate of change of voltage with respect to time which is substantially linearly proportional to the output of said rectification means;

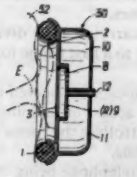
means for comparing said reference voltage and said exponentially decaying integration voltage and for generating a comparator output signal when said compared reference voltage and said integration voltage are equal; and

logic means for converting said comparator output into a digital indication in decibels of the level of said input ac electrical signal.

4,160,135
CLOSED EARPHONE CONSTRUCTION

Rudolf Görike, Vienna, Austria, assignor to AKG Akustische u.Kino-Geräte Gesellschaft m.b.H., Austria

Filed Apr. 10, 1978, Ser. No. 895,047
Claims priority, application Austria, Apr. 15, 1977, 2652/77
Int. Cl.[2] H04R *1/28*
U.S. Cl. 179—182 R **5 Claims**



1. An earphone construction, comprising a housing having a partition plate with an opening therethrough, an electroacoustic converter having a sound-transmitting diaphragm disposed in the opening with a front side disposed toward a wearer's ear and with an opposite backside, an annular ear cushion secured

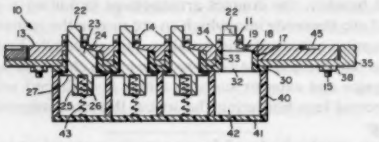
to the periphery of said partition adapted to engage around the wearer's ear, said ear cushion when engaged with the wearer, forming a coupling space with said diaphragm, a back covering connected to said partition plate and having a portion spaced from said partition plate and defining a sound-proof cavity behind said partition plate, a partial wall spaced from said partition plate on the opposite side thereof from said diaphragm and defining a high restoring force cavity with said partition plate, a duct connected from said high restoring force cavity to the exterior of said housing and partly enclosing an air mass acting as an acoustic mass, and an acoustic frictional resistance defining a communication between said restoring force cavity and said soundproof cavity.

4,160,136

ANTI-VANDALISM ARRANGEMENT FOR PROTECTING THE TOUCH CALLING UNIT OF A COIN TELEPHONE

Gerald B. McGough, Huntsville, Ala., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 25, 1978, Ser. No. 909,739
Int. Cl.[2] H04M *1/23*
U.S. Cl. 179—184 **11 Claims**



1. Anti-vandalism means for use on a telephone station apparatus including an external casing, said casing including a plurality of apertures therein, a touch calling unit mounted internally within said casing and including guide collars each extending thru a different one of said apertures, and a plurality of cavities each in alignment with said guide collars, said anti-vandalism means comprising:

a plurality of pushbuttons each slidably mounted within one of said cavities and moveable between an extended position and a depressed position and normally biased toward said extended position, said pushbuttons each including an upper section, said upper section arranged in a L-shaped structure including a horizontal stop member having a top surface and an operating member vertically oriented and perpendicular to said stop member top surface extending outward from a portion of said upper section;

a shield plate including a plurality of apertures therein adapted to be mounted on said telephone station apparatus casing in alignment with said touch calling unit guide collars, said shield plate apertures including protective portions arranged to encompass each of said operating members and said operating members extending outward of said protective portions;

whereby said touch calling unit is operable by application of normal manual pressure to said operating members and said touch calling unit is protected from application of excessive mechanical pressure to said operating members.

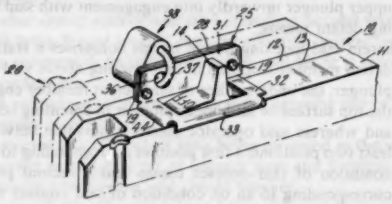
4,160,137

BRACKET MEANS TO MOUNT A PADLOCK FOR BLOCKING MOVEMENT OF A SWITCH HANDLE

Ralph C. Clement, and William R. Latimer, both of Bellefontaine, Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 28, 1977, Ser. No. 865,224
Int. Cl.[2] H01H *27/00*
U.S. Cl. 200—42 T **11 Claims**

1. An electrical switch and a field installable device to receive a padlock in operative position blocking movement of a switch operating handle to ON position; said switch including an insulating housing and an operating handle mounted for movement between ON and OFF positions, said handle projecting outside of said housing for manual engagement; said device including bracket means comprising first and second elements having respective first and second feet in holding positions inserted into external recesses of said housing for



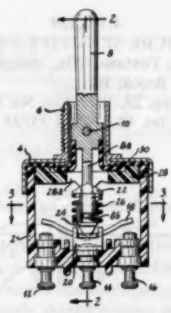
mounting said device on said switch, securing means holding said first and second elements fixed with respect to each other and in operative position wherein said feet are maintained in said holding positions, said bracket means including aperture means to receive a lock shackle and thereby position such lock to block movement of said handle to its said ON position.

4,160,138

SWITCH WITH INDEXING DETENT BLOCK

Harry W. Brown, Big Bend, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Sep. 1, 1977, Ser. No. 829,808
Int. Cl.[2] H01H *21/04*
U.S. Cl. 200—67A **14 Claims**



1. An electric switch comprising:

a housing;

contact means mounted in said housing;

operator means movably mounted to said housing;

first and second actuator means carried by said operator means, said first actuator means being engageable with said contact means for actuation thereof in response to movement of said operator means;

indexing detent means disposed in said housing and engageable with said second actuator means in indexing relation; and

means biasing said first and second actuator means apart such that said first actuator means is biased into engagement with said contact means and said second actuator means is biased into engagement with said indexing detent means whereby a positive position feel of said operator means is provided by said indexing detent means corresponding to a condition of said contact means;

wherein said operator means has a shaft extending down into said housing, said first actuator means comprises a lower plunger disposed on said shaft at the bottom thereof for sliding movement along the longitudinal axis of said shaft,

said second actuator means comprises an upper plunger disposed on said shaft above said lower plunger for sliding movement along said longitudinal axis of said shaft, and said biasing means bears between said upper and lower plungers to bias said lower plunger downwardly into engagement with said contact means and to bias said upper plunger upwardly into engagement with said indexing detent means;

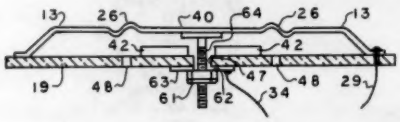
wherein said indexing detent means comprises a stationary detent member disposed in said housing above said upper plunger, the undersurface of said detent member engaging the top surface of said upper plunger in detenting relation, and wherein said operator means is movable between at least two positions, a first position corresponding to an off condition of said contact means and a second position corresponding to an on condition of said contact means, and wherein said detent member has at least two detent portions formed on said undersurface thereof, a first detent portion engaging said top surface of said upper plunger in stable indexed detented relation when said operator means is in said first position and a second detent portion engaging said top surface of said upper plunger in stable indexed detented relation when said operator means is in said second position.

4,160,139

PRESSURE SENSITIVE SWITCH

Samuel A. Johnston, Fontana, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 29, 1977, Ser. No. 828,622
Int. Cl.[2] N01H *35/38*
U.S. Cl. 200—83 N **30 Claims**



1. A pressure sensitive switch comprising:

a housing including a cap having a top wall and a continuous side wall,

a spacer tightly disposed within said housing and including a support surface,

a dielectric substrate secured to said support surface of said spacer,

a metal diaphragm mounted about its periphery on said substrate and forming a first cavity with said top wall of said cap and a second cavity with said substrate,

said first cavity communicating with a source of fluid pressure,

said metal diaphragm having a large resilient surface portion movable toward and away from said substrate in response to variations in fluid pressure within said first cavity,

a first contact supported by said substrate in a preselected position relative to said diaphragm, and

a second contact supported by said diaphragm and arranged for movement with said diaphragm,

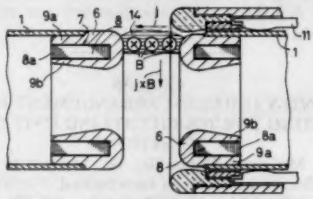
said second contact engaging and disengaging said first contact in response to variations in fluid pressure within said first cavity.

4,160,140

CONTACT ARRANGEMENT FOR PRESSURIZED-GAS CIRCUIT BREAKER

Klaus-Peter Rolff, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 797,481
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1976, 2626245
Int. Cl.[2] H01H *33/18*
U.S. Cl. 200—147 A **4 Claims**



1. In a contact arrangement for use in a pressurized-gas circuit breaker, the contact arrangement including a nozzle-shaped arc electrode into which an arc runs in the course of the interrupting action of said breaker, said electrode having an annular slot formed by a cross-section of the electrode between its interior and exterior surfaces which is U-shaped with first and second legs bordering the space, the improvement comprising:

(a) an annular body of ferromagnetic material arranged in said slot between said first and second legs; and

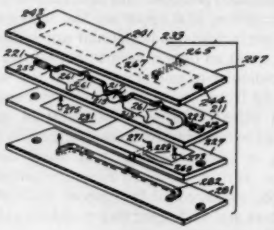
(b) means insulating said annular body from said electrode.

4,160,141

ELECTROSTATIC SWITCH

Ronald E. Graf, Rte. 3, Box 520, Crozet, Va. 22932

Division of Ser. No. 502,224, Aug. 30, 1974, Pat. No. 3,955,059.
This application Jan. 12, 1976, Ser. No. 648,571
Int. Cl.[2] H01H *57/00*
U.S. Cl. 200—181 **11 Claims**



1. An electrostatically controlled switch comprising

a dielectric structure having a plurality of chambers formed therein each of said chambers being joined to at least one other chamber of the group by a constricted region between said pair of chambers, the volume of any said constricted region or regions being substantially smaller than any of said chambers,

a pair of conductive plates positioned on opposite sides of each of said chambers, each such pair of plates substantially sandwiching one and only one chamber, and each pair of plates extending to partially sandwich any said constricted region adjoining the chamber upon whose opposite sides the plates are,

a liquid positioned in one of said chambers and extending somewhat beyond the chamber into but not beyond any said adjoining constricted region when no voltage is ap-

plied to the system so that said liquid is also between a portion of the plates associated with any chamber adjoining mutually to the liquid containing chamber through a said constricted region,

at least some respective area on the surface of any given said constricted region, each said constricted region having its own separate area, which respective area is an area of overlap, being contacted at all points by said liquid extending from its chamber whenever the said liquid is resting in any said chamber adjoining the given said constricted region with no voltage applied to the system, the same said area of overlap being contacted at all points by said liquid no matter which adjoining said chamber contains the main body of the liquid at rest,

means for establishing a voltage across the conductive plates of any one of said chambers,

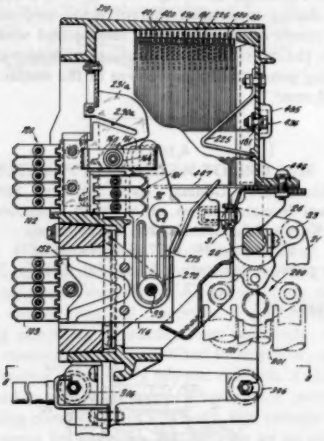
and means positioned at a plurality of points in said at least one chamber for conducting light energy with respect to said at least one chamber, said light being affected by the presence of said liquid in said at least one chamber but not being similarly affected in the absence of said liquid in said at least one chamber, said liquid being moved into a selected chamber when a voltage is established across the conductive plates positioned on opposite sides of said chamber providing that the liquid to be moved is resting in an adjoining chamber at the time of establishment of a sufficient voltage, that no voltage is being simultaneously applied across any chamber other than said selected chamber which could interfere with liquid movement, and that said sufficient voltage is held for a sufficient time.

4,160,142

CIRCUIT BREAKER MAIN AND DISCONNECT CONTACT STRUCTURE

Charles I. Clausing, Marlton, N.J., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 16, 1978, Ser. No. 869,857
Int. Cl.[2] H01H *1/50, 3/00*
U.S. Cl. 200—254 **20 Claims**



1. In a circuit breaker having a stationary contact structure and a complementary blade contact structure;

said stationary contact structure comprising at least one pair of contact jaws; said blade being receivable in said jaws to establish current carrying connection between said blade and said jaws;

a current carrying bar in said circuit breaker;

means for connecting said pair of contact jaws at one end of said current carrying bar;

said pair of contact jaws each comprising an elongated member identical to each other, facing each other;

said means for connecting said jaws on said current carrying bar including further means biasing said jaws toward each other; one end of each of said jaws being biased into current connecting engagement with said current carrying bar;

the other end of each of said jaws extending beyond said bar and being biased toward each for effective current carrying connection to said blade when said blade is inserted therebetween;

and a second pair of contact jaws at the opposite end of said current carrying bar;

said second pair of contact jaws being mounted in the same manner as said first set of contact jaws and forming disconnect contacts for said circuit breaker;

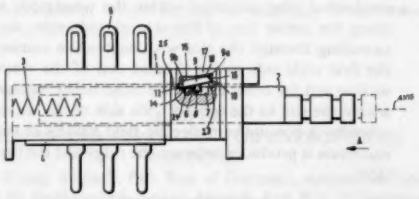
said second pair of contact jaws being identical in structure and shape to said first pair of contact jaws and being mounted on said opposite end of said current carrying bar in the same manner as said first pair of contact jaws.

4,160,143

SLIDE KEY

Herbert Schlesier, Hildesheim, and Alfred Scheuer, Bad Salzdetfurth, both of Fed. Rep. of Germany, assignors to Petrick GmbH Elektro-Mechanische Bauelemente, Bad Salzdetfurth, Fed. Rep. of Germany

Filed Dec. 22, 1977, Ser. No. 863,302
Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722813
Int. Cl.[2] H01H *9/20*
U.S. Cl. 200—328 **10 Claims**



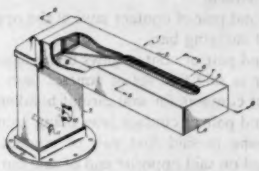
1. A slide key comprising, in combination, a housing having a socket defining an axis and having a recess at a predetermined location therein, the recess communicating with the socket; a slide bar correspondingly shaped relative to the socket so as to be fittable therein and having a hollow depression positioned at a portion thereof corresponding to said predetermined location and being communicable with the recess, said slide bar having a projection having a rear surface and extending radially within the depression and an inclined surface extending from said projection for a predetermined distance along said slide bar, said slide bar further having a notch into which said inclined surface extends and which is a remote end of said inclined surface relative to said projection; a spring in said housing projecting into the socket along the axis, whereby said slide bar is spring-biased in an axial direction outwardly of the socket; and a lock locatable within the recess and having a peg extending therebelow, said peg being alternately engageable with said rear surface of said projection so as to lock said slide bar into a particular axial position and disengageable from said rear surface of said projection so as to release said slide bar, said lock having a front and a rear stop surface and a front portion extending from said peg to said front stop surface, said front stop surface of said lock engaging said notch as said front portion lies against said inclined surface and said peg of said lock engages said rear surface of said projection of said slide bar.

4,160,144

SINGLE-SIDED MICROWAVE APPLICATOR FOR SEALING CARTONS

Satish C. Kashyap, Hazeldean, and Walter Wyslouzil, Carlsbad Springs, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jan. 25, 1978, Ser. No. 872,228
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 A **5 Claims**



1. A single-sided microwave applicator comprising:

a section of rectangular microwave waveguide having two narrow sides and two wide sides, one end of the waveguide section being open to receive microwave energy for producing standing waves within the waveguide section and the other end of said waveguide section being shorted, the waveguide section further having an elongated slot in the first wide side, extending along the center line of the wide side from the shorted end of the waveguide section; and

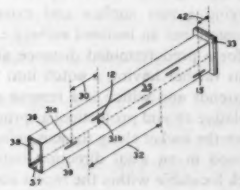
a conductive ridge mounted within the waveguide section along the center line of the second wide side, the ridge extending through the slot with one end in contact with the first wide side at the shorted end of the waveguide section and the other end of the ridge being tapered from within the slot to the second wide side of the waveguide, whereby a non-uniform electric field having at least one maximum is produced between the ridge and the first wide side.

4,160,145

MICROWAVE APPLICATOR DEVICE

Werner Rueggeberg, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Feb. 16, 1978, Ser. No. 878,285
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 F **8 Claims**



1. In a microwave applicator including a rectangular waveguide section having a plurality of resonant slot means communicating through one of the broadwalls of the waveguide for coupling microwave energy out of the waveguide, the improvement which comprises:

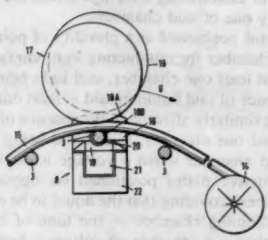
positioning the centers of said slot means outward from the longitudinal center line of said broadwall by varying distances in order to provide for the coupling of varying amounts of energy through said slot means out of said waveguide.

4,160,146

METHOD FOR MAKING REINFORCING BASKETS FOR STEEL REINFORCED HOLLOW CONCRETE BODIES

Günter Mundel, and Jean-Claude Poutet, both of Kehl, Fed. Rep. of Germany, assignors to Ed. Züblin Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 11, 1977, Ser. No. 814,428
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1976, 2631501
Int. Cl.[2] B23K 11/06
U.S. Cl. 219—58 **7 Claims**



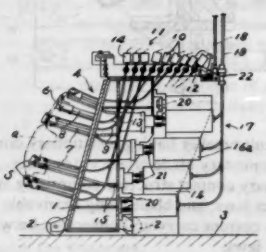
1. The method of making reinforcing grids from weldable wires, especially reinforcing grids for hollow concrete bodies which comprises; moving first wires in circumferentially spaced grouped relation in substantially the direction of the length of the wires, winding a second wire about said group of wires along a substantially helical path, engaging said second wire by a welding electrode, sensing each point intersection of said second wire with a said first wire by a contact electrode adapted electrically to engage the respective first wire, exerting pressure on said welding electrode at each said point of intersection of said wires while supplying welding current to said electrodes, and relieving said welding electrode from pressure during movement thereof along said second wire between points of intersection of said second wire with said first wire, the development of pressure on said welding electrode being generated by movement of the contact electrode relative thereto.

4,160,147

MULTI-SPOT WELDING APPARATUS

Soichi Matsubara, Gunma; Ryo Niikawa, Sayama, and Morikuni Numata, Omiya, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1977, Ser. No. 811,671
Claims priority, application Japan, Jul. 2, 1976, 51-77769
Int. Cl.[2] B23K 11/10
U.S. Cl. 219—87 **1 Claim**



1. A multi-spot welding apparatus comprising: a machine

frame, said machine frame being formed with a front frame and a rear frame being detachably coupled together; a jig table on the front figure of said machine frame; a plurality of welding guns on said jig table and located along the contour shape of a workpiece to be worked, each of said guns being formed with stationary and movable arms; electric supply means located on said rear frame having a plurality of electric supply units connected to said welding guns through respective electric supply cables; pressure applying means located on said front frame having a plurality of operational cylinders each connected to said respective welding guns through respective flexible wires at said respective moveable arms and located on the rear side and upper side of said machine frame; clamping means actuatable by said operational cylinders after a workpiece is placed on said jig table on the front surface of said machine frame, said operation cylinders actuating said clamping means through said flexible wires, fixedly clamp said workpiece and make ready for a subsequent working operation, said welding guns being operated by said operation cylinders through said flexible wires so that said workpiece has applied thereto a substantially large number of spot-welds at a substantially large number of points on said workpiece, said electric supply guns being connected to said electric units through said supply cables so that an electrical current passes between opposing electrodes through said workpiece to produce a spot-weld, said clamping means being released after said spot-weld is produced for removing said workpiece therefrom.

4,160,148

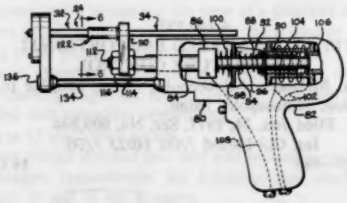
STUD WELDING APPARATUS

John C. Jenkins, Lorain, Ohio, assignor to TRW Inc., Cleveland, Ohio

Division of Ser. No. 663,056, Mar. 2, 1976, Pat. No. 4,085,307. This application Dec. 30, 1977, Ser. No. 865,910

Int. Cl.[2] B23K 9/00

U.S. Cl. 219—98 **1 Claim**



1. A welding tool for welding an elongate metal stud to a workpiece, said stud having an elongate rod-like member extending from one end thereof, the rod-like member having a transverse dimension smaller than a corresponding dimension of the stud, said welding tool comprising a welding tool body, a chuck leg extending forwardly from said body, an offset member of conductive material affixed to an end of said chuck leg and extending transversely beyond one side of said tool, a chuck affixed to said offset member, said chuck having a passage extending completely therethrough, said passage having a shoulder therein for engaging and backing up an end of the stud from which the elongate rod-like member extends, said chuck having resilient fingers for engaging an outer surface of the stud adjacent the end engaged by said shoulder, said chuck positively preventing rearward movement of the stud in said chuck, a welding foot, a spark shield member carried by said welding foot for holding a ferrule, said spark shield member having resilient means for engaging the ferrule, and means carried by said welding tool body for positioning said spark shield member in alignment with said chuck and spaced forwardly thereof away from said tool body.

4,160,149

METHOD FOR WELDING WORKPIECE PARTS BY MEANS OF AN ENERGY BEAM

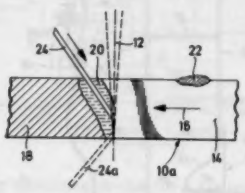
Wilhelm Scheffels, Puchheim, and Johannes Koy, Germering, both of Fed. Rep. of Germany, assignors to Steigerwald Strahltechnik GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,325

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1976, 2634833

Int. Cl.[2] B23K 9/00

U.S. Cl. 219—121 EM **7 Claims**



1. A method for welding relatively thick workpiece parts, by means of an energy beam, more particularly an electron beam, in the case of which the energy beam is moved with the production of a welding channel, which comprises fused workpiece material, along a joint gap to be closed by welding in relation to the workpiece parts forming the joint gap and filler material is introduced into the welding zone for filling the joint gap, characterized in that the position, speed and force with which the filler material is introduced into the fused workpiece material are selected to exert physical and thermal forces on the fused material which reduce the tendency of the fused material to flow out of said joint gap.

4,160,150

METHOD AND APPARATUS FOR ENERGY BEAM WELDING

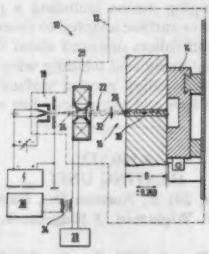
Dieter König, Munich, Fed. Rep. of Germany, assignor to Steigerwald Strahltechnik GmbH, Munich, Fed. Rep. of Germany

Filed May 9, 1978, Ser. No. 904,293

Claims priority, application United Kingdom, May 11, 1977, 19832/77

Int. Cl.[2] B23K 9/00

U.S. Cl. 219—121 EB **9 Claims**



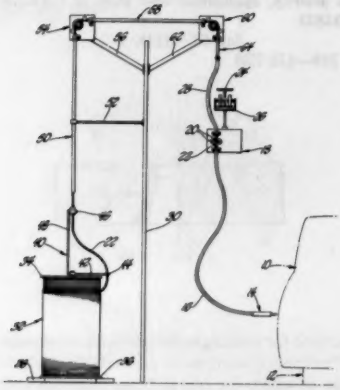
1. A method for energy beam welding by means of an energy beam which has its beam axis directed onto a welding zone of a workpiece and is focussed in a focal point along the beam axis and which in the welding zone produces a molten mass which has the tendency to flow out of the welding zone, characterized in that the tendency of the molten mass to flow out of the welding zone is reduced by continuously changing the focussing condition of the beam.

4,160,151

WELDING WIRE FEED SYSTEM

Peter Tonita, Windsor, Canada, assignor to C. H. Symington & Co., Inc., Royal Oak, Mich.

Filed Jun. 30, 1977, Ser. No. 811,649
Int. Cl.[2] B23K *9/12*
U.S. Cl. 219—137.8 **7 Claims**



1. A welding wire feed system of the type including a welding gun, a welding wire containing spool having axially spaced flanges, said spool being remotely located relative to said welding gun and supported upon one of said flanges, means associated with said spool for uncoiling the welding wire therefrom and paying out said wire in an upwardly direction coaxially of said spool, means proximate said welding gun for engaging and feeding the welding wire from said spool to the welding gun, and means for guiding said welding wire between said wire feeding means and said wire uncoiling means; the improvement comprising: welding wire guiding means which includes first and second wire direction changing means vertically spaced above both said spool and said wire feeding means; a first straight length of welding wire receiving conduit means aligned between said uncoiling means and said first wire direction changing means and being coaxial with said spool; a second straight length welding wire receiving conduit means disposed between one of said wire direction changing means and said wire feeding means, said wire direction changing means maintaining said welding wire substantially out of sliding engagement with said straight lengths of welding wire receiving conduit means when said feeding means is transmitting welding wire from said spool to said welding gun; each wire direction changing means including a pulley having a circumferential groove surface adapted to receive said welding wire, first and second rollers disposed about the periphery of each pulley for maintaining said welding wire in circumferential contact with each pulley groove surface and in coaxial alignment with said first and second conduit means.

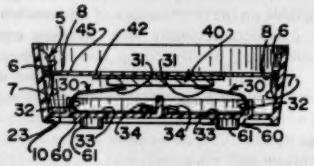
4,160,152

HEATING UNIT

John W. Wightman, 201 E. Norman Dr., Palatine, Ill. 60067, and Lawrance W. Wightman, 3 Ridgecreek, St. Louis, Mo. 63141

Filed Dec. 4, 1978, Ser. No. 966,015
Int. Cl.[2] F27D *11/02*
U.S. Cl. 219—438 **11 Claims**

1. A heating unit comprising an open-topped container having a side wall and a bottom; a plurality of bosses on the inside surface of said side wall, each of said bosses having a plate-receiving groove extending in a direction parallel with said bottom and all lying in the same plane; elongated terminal seat-defining flanges on the upper surface of said bottom; a barrier wall projecting between and extending laterally beyond a pair of facing seat-defining flanges to separate said seats and to separate a pair of wires; labyrinth walls defining a strain-relief circuitous wire passage one end of which communicates with an opening through said container and the other with said seats; a pair of spring terminal contacts each having a U-shaped part defined by two divergent leg parts one of which is seated in one of said seats and the other of which extends upwardly away from said bottom to a free end, the free ends of the two terminals being spaced from one another; a pair of electrical conductors having an insulating sheath intermediate their ends, and electrically connected at one end to the seated legs of said terminal-contacts, said conductor being separated adjacent said ends by said barrier wall, lying within the passage defined



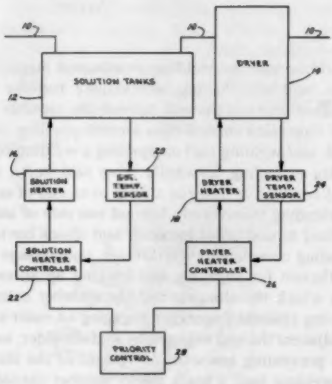
by said labyrinth walls and extending through said opening in said container; a disc of PTCR material mounted on and in electrical contact with said spaced free ends of said upwardly extending terminal legs; a plate, shaped complementarily to the inside of said side wall and of a size to extend into the plate-receiving grooves of the said bosses, the height of the said grooves above the bottom, the height of the terminal-contact legs, and the thickness of the disc being such as to cause the disc to compress the terminal legs against their spring bias, whereby the disc is held in snug electrical and mechanical contact with the terminal legs, and the terminals are held against upward movement by the disc and sideways movement by the terminal seat-defining flanges.

4,160,153

DUTY CYCLE SHARED PROPORTIONAL TEMPERATURE CONTROL

Theodore A. Melander, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Jun. 24, 1977, Ser. No. 809,844
Int. Cl.[2] H02M *7/00*; H02J *3/00*
U.S. Cl. 219—485 **14 Claims**



1. In a processor of photosensitive material having a solution heater and a dryer heater, a control system comprising:

solution heater control means for controlling input power provided to the solution heater;

dryer heater control means for controlling input power provided to the dryer heater; and

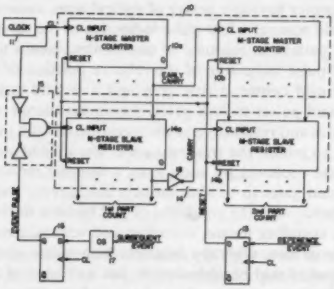
priority means for coordinating the operation of the solution heater control means and the dryer heater control means to give the solution heater priority to input power until power demand of the solution heater control means decreases to a predetermined level and then permitting the solution heater control means and the dryer heater control means to share input power.

4,160,154

HIGH SPEED MULTIPLE EVENT TIMER

Richard A. Jennings, Thousand Oaks, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jan. 10, 1977, Ser. No. 757,827
Int. Cl.[2] H03K *21/08*
U.S. Cl. 235—92 EA **10 Claims**



1. Apparatus for measuring the time of a plurality of successive event pulses with respect to a reference time or event by counting clock pulses, where each event pulse is of sufficient duration to allow for propagation of any carries through at least N counting stages and for thereafter reading out the count in parallel, said apparatus comprising,

a source of said clock pulses,

a master circuit divided into first and second parts of N and M stages, respectively, for counting said clock pulses, where N and M are integers,

means for causing said second part of said master circuit to respond to a transition of the most significant stage of said first part of said master circuit to a maximum value, whereby the second part is advanced in its normal count of clock pulses by a predetermined amount,

a slave circuit divided into first and second parts of N and M stages,

means for causing said first part of said slave circuit to follow said first part of said master circuit, except during the presence of an event pulse,

means for producing a normal carry from said first part of said slave circuit in response to a transition of the most significant stage thereof from a maximum value to a minimum value, and

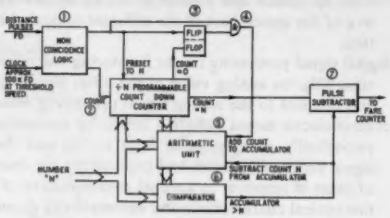
means responsive to said normal carry for causing said second part of said slave circuit to be set to the state of the second part of said master circuit, whereby the output of said first and second parts of said slave circuit provide a running count of clock pulses since said reference time or event, and the running count present at the time of each successive event pulse is captured during the presence of the event pulse.

4,160,155

TAXIMETER INDICATING DEVICES

David J. Steele, Newnham; Andrew I. O. McLean, Northampton, and Martin B. Anderson, London, all of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Feb. 22, 1978, Ser. No. 880,061
Int. Cl.[2] G07B *13/00*
U.S. Cl. 235—92 TC **3 Claims**



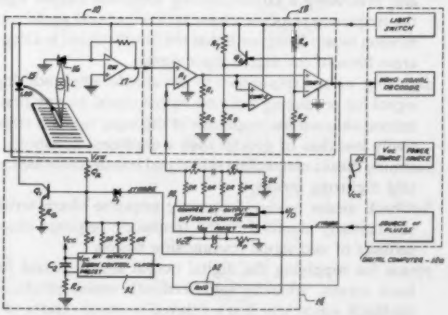
1. In a charge indicating device for a taximeter that is responsive to distance pulses proportional to the distance traveled, and time pulses proportional to the time elapsed, the improvement comprising counter means for performing a predetermined count, the counter means being reset on reaching the said count; said counter means including the counter clock input means for receiving the time pulses whereby the counter is clocked towards the predetermined count, and counter reset input means for receiving the distance pulses whereby the counter is reset when each distance pulse is received; counter output means for providing an output pulse whenever the counter means is reset; residual count sensing means for sensing a residual count of the counter means when reset by a first distance pulse immediately following the reaching of the said predetermined count; and subtraction means for receiving output pulses provided by the counter output means and for subtracting a pulse in dependence upon the said residual count whereby the subtraction means provides a pulse train representative of an indicated charge.

4,160,156

METHOD AND APPARATUS FOR READING BAR CODED DATA WHEREIN THE LIGHT SOURCE IS PERIODICALLY ENERGIZED

Paul Sherer, Costa Mesa, Calif., assignor to MSI Data Corporation, Costa Mesa, Calif.

Filed May 4, 1978, Ser. No. 902,892
Int. Cl.[2] G06K *7/14*; G08C *9/06*
U.S. Cl. 235—463 **17 Claims**



1. Apparatus for optically reading bar coded data wherein the binary bits are encoded in terms of bars of different widths of the same optical characteristics separated by areas of the opposite optical characteristic comprising

optical sensing means for producing electrical signals repre-

sentative of the optical characteristics of a surface presented thereto upon the production of relative movement between the surface and the sensing means, said sensing means having a light source and a light sensor for receiving the light rays from the light source reflected from the surface being sensed, the sensor output signals including an unknown offset voltage,

analog signal processing means for processing the signals from the sensor and providing analog signals representative of the sensed bars of the different optical characteristics,

digital signal processing means for storing and continuously signalling the analog value of the offset signals generated and coupled to the analog signal processing means, and

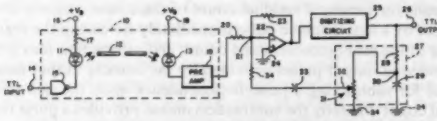
control circuit means including means for automatically and periodically energizing the light source and the analog signal processing means and maintaining the energization of same in response to a signal representative of a bar of one optical characteristic and automatically de-energizing said same elements in response to a signal representative of a bar of the other optical characteristic.

4,160,157

SIGNAL TRANSMISSION CIRCUIT WITH IMPROVED DIGITAL SIGNAL RECOVERY

John C. Freeborn, West Covina, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 20, 1976, Ser. No. 752,228
Int. Cl.[2] G02B 5/14
U.S. Cl. 250—199 **4 Claims**



4. A digital signal transmission circuit with feedback means for achieving enhanced high frequency performance comprising:

input means for supplying a digital input signal;

signal transmission means connected to receive the digital input signal, said signal transmission means comprising a fiber-optic element, a light emitting diode for supplying an optical signal corresponding to the digital input signal to said fiber-optic element, and a photodetector device for receiving the optical signal from said fiber-optic element and producing a corresponding electrical output signal, the frequency response characteristics of said signal transmission means being such that the output signal is a degenerate form of the digital input signal;

digitizing means responsive to a variable amplitude input signal for producing a digital output signal having first or second values if the amplitude of the input signal is respectively less than or greater than a digitizing threshold;

summing means connecting said signal transmission means to said digitizing means;

feedback means having frequency response characteristics substantially identical to the frequency response characteristics of said signal transmission means;

means for supplying the digital output signal to said feedback means, whereby said feedback means produces a feedback signal which is a delayed inverted replica of the output signal of said signal transmission means; and

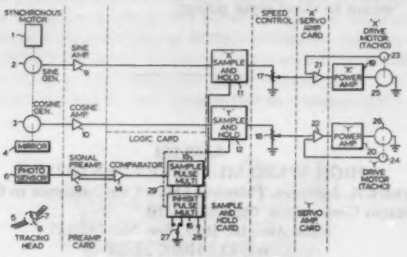
means for connecting said feedback means to said summing means so that said summing means supplies a signal to said digitizing means representative of the combined feedback signal and the output signal of said signal transmission means.

4,160,158

OPTICAL TRACER BACK-UP CIRCUIT

Enn Vali, Burlington, Canada, assignor to Westinghouse Canada Limited, Hamilton, Canada

Filed Jan. 16, 1978, Ser. No. 869,819
Claims priority, application Canada, May 16, 1977, 278522
Int. Cl.[2] G05B 1/00
U.S. Cl. 250—202 **4 Claims**



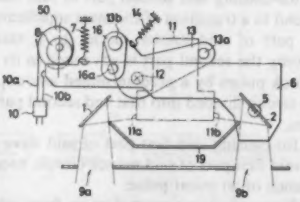
1. In a pattern tracing system, a circular scanning electro-optical scanner having a center of optical scan, means to produce from said scanner a first pulse indicative of the relative position of said pattern in advance of said center, means to produce a second pulse indicative of the relative position of said pattern behind said center, a first gate and a second gate, means to apply said pulses to said gates, means associated with each of said gates and responsive to the transmission of a pulse through a gate, to inhibit the transmission of the immediately succeeding pulse received by such gate, a bistable device, means to cause said gates to be alternatively exclusively transmissive in accordance with the condition of said bistable device, selection means, coupling means, coupling said selection means to said bistable device, whereby said selection means determines the condition of said bistable device, but a change of condition of said selection means causes a change of condition of said bistable device only upon the structure of one of said pulses.

4,160,159

AUTOMATIC FOCUSSING APPARATUS

Masatoshi Kakukawa, and Hideyuki Kondo, both of Suwa, Japan, assignors to Sankyo Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Nov. 30, 1977, Ser. No. 856,038
Int. Cl.[2] G01J 1/36; G03B 7/08
U.S. Cl. 250—204 **7 Claims**



1. In an automatic focussing apparatus including a stationary reflecting mirror and a movable reflecting mirror which are disposed behind respective light entry windows and which reflect entering light to respective light receiving surfaces for comparison of the amount of light received by the respective surfaces for movement of a focussing lens to perform an automatic focussing operation responsive to such comparison; the apparatus comprising first drive means operable to repeatedly effect an angular movement of said movable reflecting mirror; second drive means operable to move said focussing lens; means producing a first signal when the amount of light re-

ceived from said movable reflecting mirror is equal to that received from said stationary reflecting mirror; means producing a second signal indicative of the position of said focussing lens; and control means operable to determine the direction in which the focussing lens is to be moved in accordance with the relative timing of the occurrence of the first signal and the second signal; said means producing the second signal comprises a member movable as a unit with said movable reflecting mirror, and another member mounted for movement as a unit with said focussing lens, said members conjointly forming a switch.

4,160,160

CIRCUIT FOR INTEGRATING A QUANTITY OF LIGHT IN AN AUTOMATIC CONTROL TYPE FLASH UNIT

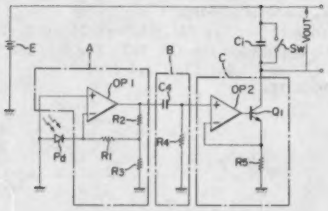
Hiroshi Hasegawa, Tokyo; Yoshiaki Ohtsubo, Kawasaki; Sakuji Watanabe, Yono, all of Japan, and Kouichi Takahata, deceased, late of Tokyo, Japan (by Kosaku Takahata, legal successor), assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 20, 1977, Ser. No. 798,835

Claims priority, application Japan, May 28, 1976, 51-61935

Int. Cl.[2] G01J *1/46*; G03B *7/08*

U.S. Cl. 250—214 P **3 Claims**



1. A circuit for integrating a quantity of light in an automatic control type flash unit having flash means for providing flash illumination, comprising:

light responsive means positioned for receiving light resulting from the flash illumination and for converting the received light into a corresponding electrical signal;

an amplifier circuit for amplifying said electrical signal and generating an output voltage which consist of a signal component corresponding to the amplified electrical signal and an error component corresponding to DC and low frequency error voltages;

a high-pass filter for eliminating said error voltages from the output voltage of said amplifier circuit and for putting out only the voltage corresponding to said electrical signal;

a voltage-current conversion circuit for putting out a current corresponding to the voltage put out by said high-pass filter; and

a capacitor charged with the current from said voltage-current conversion circuit, whereby the charging voltage of said capacitor assumes a value which is the result of integration of the intensity of the light received by said light responsive means.

4,160,161

LIQUID CHROMATOGRAPH/MASS SPECTROMETER INTERFACE

Robert L. Horton, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 30, 1978, Ser. No. 910,728

Int. Cl.[2] B01D *59/44*

U.S. Cl. 250—281 **40 Claims**

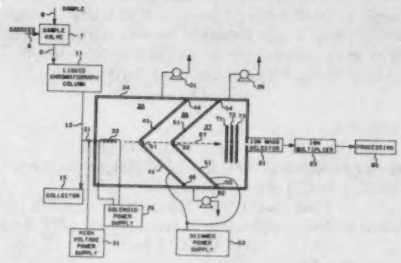
1. In liquid chromatography wherein a mass spectrometer is utilized as a detector, an improved interface between a liquid chromatograph column and a mass spectrometer comprising:

an ion source having at least first and second chambers, said first chamber and said second chamber being divided by at least one skimmer plate, said at least one skimmer plate having a small hole therein;

first pumping means operatively connected to said first chamber;

second pumping means operatively connected to said second chamber;

a conduit means for supplying solvent and solute from said liquid chromatograph column to said first chamber of said ion source; means for applying a high voltage potential to



said conduit means, said high voltage potential being sufficient to at least partially ionize said solute, said conduit means being sealed to but electrically insulated from said ion source;

means for passing the ionized portion of said solute through said small hole in said at least one skimmer plate into said second chamber of said ion source; and

means for supplying said ionized portion of said solute from said ion source to said mass spectrometer to therein analyze said ionized portion of said solute.

4,160,162

METHOD FOR THE PICTORIAL DISPLAY OF A DIFFRACTION IMAGE IN A TRANSMISSION-TYPE, SCANNING, CORPUSCULAR-BEAM MICROSCOPE

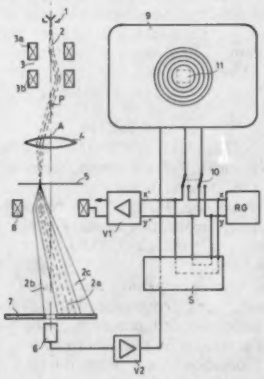
Karl-Heinz Müller, and Volker Rindfleisch, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 1, 1977, Ser. No. 847,439

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1976, 2652273

Int. Cl.[2] G01N *23/00*

U.S. Cl. 250—311 **5 Claims**



1. In a method for pictorially displaying a diffraction image in a transmission-type, scanning, corpuscular-beam microscope in which beam detector means is scanned by a diffraction image moved by deflection means in line-raster fashion in a first, predetermined direction over said beam detector means,

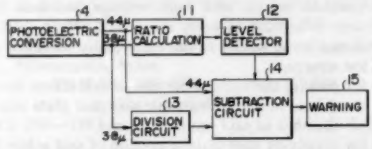
said beam detector means generating an output signal for controlling the brightness of a television monitor for displaying said diffraction image, the improvement comprising the step of additionally exciting said deflection means so as to move said diffraction image in another second, predetermined direction over said beam detector means which is perpendicular to said first, predetermined direction so that a predetermined area of said diffraction image including at least part of the cross-section of maximum intensity of the null reflex of said beam is prevented from striking said beam detector means and is thereby excluded during scanning of said beam detector and said diffraction image displayed by said television monitor is blanked in an area corresponding to the cross-section of said diffraction image which is excluded during scanning.

4,160,163

FLAME SENSING SYSTEM

Shunsaku Nakauchi, Mitaka, Japan, assignor to Security Patrols Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1977, Ser. No. 825,386
Claims priority, application Japan, Feb. 15, 1977, 52-14640
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—339 **2 Claims**



1. A flame sensing apparatus comprising detecting means for producing a first electric output corresponding to the intensity of a first radiation of wavelengths produced by resonant radiation of carbon dioxide and a second electric output corresponding to the intensity of a second radiation of wavelengths which are in the vicinity of the wavelengths of the first radiation and in which there is little absorption by the carbon dioxide in the air and calculating a ratio of said first and second electric outputs, a level detector for comparing said ratio with a reference level and generating a signal when the ratio exceeds the reference level, means responsive to said signal for increasing said first electric output and also for decreasing said second electric output, means for calculating a first difference between said increased first electric output and said second electric output and also for calculating a second difference between said first electric output and said decreased second electric output, and a warning device for indicating the existence of a flame when either of said differences exceeds a predetermined level.

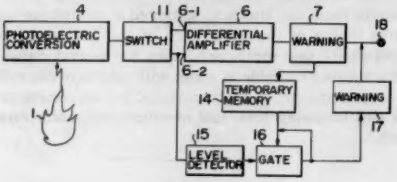
4,160,164

FLAME SENSING SYSTEM

Shunsaku Nakauchi, Mitaka, Japan, assignor to Security Patrols Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1977, Ser. No. 825,387
Claims priority, application Japan, Feb. 15, 1977, 52-14639
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—339 **3 Claims**

1. A flame sensing apparatus comprising a warning device for indicating the existence of a flame, detecting means for detecting a difference in intensity between a first radiation of wavelengths produced by resonant radiation of carbon dioxide and a second radiation of wavelengths which are in the vicinity of the wavelengths of the first radiation and in which there is little absorption by the carbon dioxide in the air, a level detector for producing a warning device actuating signal when the intensity of the second radiation exceeds a predetermined level, gating means for controlling passage of said warning device actuating signal from said level detector to said warning device, and gate controlling means for opening said gating means for a predetermined time when said difference detected by said detecting means exceeds a predetermined value, thereby permitting said warning device actuating signal to pass



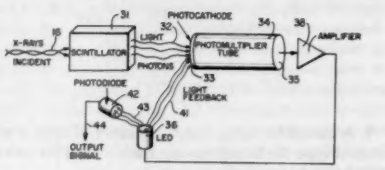
through said gating means to be applied to said warning device so that the warning device may provide an indication of the existence of a flame.

4,160,165

X-RAY DETECTING SYSTEM HAVING NEGATIVE FEEDBACK FOR GAIN STABILIZATION

Allan K. McCombs, Bedford, and Jay A. Stein, Framingham, both of Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

Continuation of Ser. No. 745,093, Nov. 26, 1976, abandoned.
This application Dec. 15, 1977, Ser. No. 860,771
Int. Cl.[2] G01J *1/42*
U.S. Cl. 250—354 **15 Claims**



1. Apparatus for detecting nonconforming radiant energy comprising,

a source of nonconforming radiant energy,

scintillation means responsive to said radiant energy for converting said radiant energy for providing a light signal representative of the intensity of said radiant energy incident upon said scintillation means,

first photoelectric transducing means having an input surface responsive to incident light energy for converting incident light energy on said input surface into a corresponding electrical signal,

second photoelectric transducing means responsive to an electrical signal for providing an output light signal representative of the input electrical signal,

means for illuminating said first photoelectric transducing means input surface with light energy from said scintillation means and from said second photoelectric transducing means so that said first photoelectric transducing means provides an electrical output signal representative of the incident combined light signal provided by said scintillation means and said photoelectric transducing means,

means for coupling the output signal from said first photoelectric transducing means to the input of said second photoelectric transducing means whereby a reduction in the intensity of nonconforming radiant energy is accompanied by an increase in the light energy provided by said second photoelectric transducing means to said first photoelectric transducing means,

third photoelectric transducing means for converting incident light energy into a representative electrical signal,

and means for coupling light energy from said second photoelectric transducing means to said third photoelectric

transducing means to provide an output signal from said third photoelectric transducing means representative of the nonconforming radiant energy incident upon said scintillation means.

4,160,166

SYSTEM FOR REGULATING MOLECULAR FLUX AND ITS APPLICATION TO CO-EVAPORATION TECHNIQUES

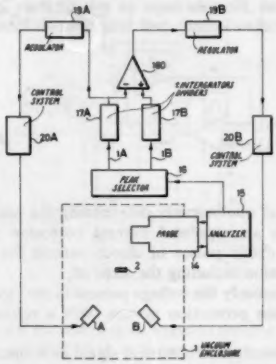
Patrick Etienne; Jean Massies, and Nguyen T. Linh, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 2, 1977, Ser. No. 847,907

Claims priority, application France, Nov. 5, 1976, 76 33471

Int. Cl.[2] H01J *27/00*

U.S. Cl. 250—423 R **6 Claims**



1. A system for regulating molecular flux, including a vacuum enclosure, units for evaporating a molecular jet turned towards a sample-holder intended to receive an epitaxy substrate, a gas analyzer consisting of a mass sweep device coupled to a peak selector able to supply n signals, n being a whole number greater than or equal to two, which measure the flux content in n predetermined molecular types respectively, and at least one servo-control loop which includes electronic means that enable an error signal to be produced by comparison of said signal with a predetermined value of said flux to be controlled as a function of said error signal.

4,160,167

DEVICE FOR MEASURING THE ABSORPTION OF RADIATION IN A SLICE OF A BODY

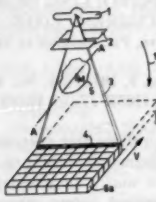
Hermann Weiss, and Günter Kowalski, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 16, 1977, Ser. No. 796,968

Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622177

Int. Cl.[2] A61B *6/02*; G01T *1/29*

U.S. Cl. 250—445 T **7 Claims**



1. A device for measuring the absorption of radiation in a slice of a body, comprising a radiator means for generating a fan-shaped radiation beam which irradiates the body during a measurement, and a detection device which is disposed in the radiation beam and which measures measuring values describing the absorption of radiation in the slice of the body, the radiator and the detection device occupying a large number of rotary positions around an axis of rotation which extends perpendicularly to the radiation and the slice during the measurement, wherein the detection device comprises a series of detection elements disposed in a direction parallel to the axis of rotation, the length of the said series being larger than the thickness of the fan-shaped radiation beam, and further comprising displacement means for displacing the series during the measurement in a direction parallel to the axis

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4,160,168

METHOD OF AND MEANS FOR DETERMINING THE LEVEL OF A METALLIC BATH

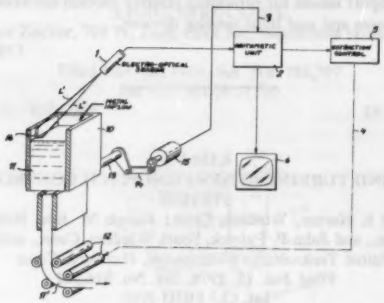
Alfred Funck, Esch, Luxembourg, assignor to ARBED - Acieries Reunies de Burbach-Eich-Dudelange S.A., Luxembourg, Luxembourg

Filed Oct. 26, 1977, Ser. No. 845,775

Claims priority, application Luxembourg, Oct. 26, 1976, 76077

Int. Cl.[2] B22D *1/02, 11/16*; G01F *23/00*; G05D *9/12*

U.S. Cl. 250—564 **8 Claims**



1. A method of determining the level of a metallic melt in a vessel subjected to an oscillatory motion, comprising the steps of electro-optically scanning a part of the inner vessel wall and of the adjoining melt surface in a succession of sweeps, detecting the location of the boundary between the wall and the melt in each sweep, translating the detected locations into signal voltages, modifying said signal voltages to offset the effect of said oscillatory motion, and averaging said signal voltages to establish a resulting level reading.

4,160,169

PARALLEL SCANNING SYSTEM

Donald L. Endicott, Jr., San Diego, Calif., and Daniel J. Solarek, Jr., Swanton, Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 13, 1978, Ser. No. 876,974

Int. Cl.[2] G06K *7/10*

U.S. Cl. 250—570 **10 Claims**

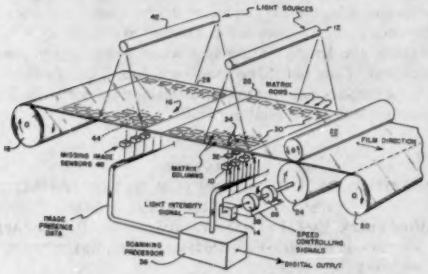
1. Apparatus for scanning graphic information contained upon plates arrayed in a matrix of rows and columns, all of the graphic information contained upon each of said plates being included in one of a plurality of scan lines and all of the graphic information included in each of said scan lines being further included in one of a plurality of picture elements, said apparatus comprising:

a light source for projecting light toward said plates;

a light sensing device corresponding to each column of said matrix, a given light sensing device for successively re-

ceiving images of the graphic information included within each of the scan lines of each of the plates in the column to which the given light sensing device corresponds,

each of said light sensing devices comprising a linear array of light responsive elements,



each of said light responsive elements for receiving light of intensity determined by the graphic information included within one of said picture elements and for generating an analog signal which is functionally related to the intensity of said received light, and;

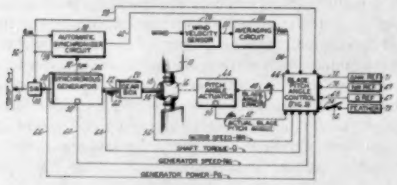
transport means for providing relative motion between said plates and said light sensing devices.

4,160,170

WIND TURBINE GENERATOR PITCH CONTROL SYSTEM

Kermit I. Harner, Windsor, Conn.; Joseph M. Kos, Holyoke, Mass., and John P. Patrick, South Windsor, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 15, 1978, Ser. No. 916,321
Int. Cl.[2] F03D *9/00*
U.S. Cl. 290—44 **36 Claims**



1. In a power generating system including a wind turbine driven generator, said wind turbine having a wind driven rotor with a plurality of variable pitch angle blades:

means for sensing a variable of operation of said system and producing a first signal indicative thereof,

means for sensing the velocity of the wind driving said rotor and producing a second signal indicative thereof,

scheduling means responsive to said first and second signals for producing as a function thereof a blade pitch angle reference signal,

means for measuring the actual pitch angle of said rotor blades and producing a third signal indicative thereof,

comparator means comparing said blade pitch angle reference signal with said third signal and producing a blade angle error signal,

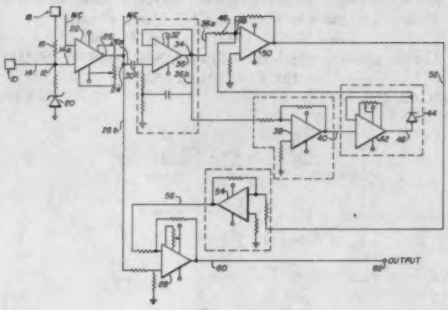
and blade pitch actuator means responsive to said blade pitch angle error signal for regulating the pitch angle of said rotor blades.

4,160,171

METHOD AND APPARATUS FOR DETERMINING THE REFERENCE VOLTAGE IN AN IMPRESSED CURRENT CORROSION PROTECTION SYSTEM

Larry H. Merrick, Houston, Tex., assignor to Harco Corporation, Medina, Ohio

Filed Aug. 5, 1977, Ser. No. 822,079
Int. Cl.[2] B01K *1/00*
U.S. Cl. 307—95 **1 Claim**



1. A method of continuously determining the natural reference voltage in an impressed current corrosion protection system having cyclic pulses of direct current for retarding undesired corrosion including the steps of:

sensing continuously the voltage present in the electrolyte of the corrosion protection system with a reference electrode;

producing a continuous electrical signal as a function of the sensed voltage;

passing the electrical signal into two separate conductive paths;

conducting the electrical signal in one conductive path to a summing amplifier without change to the electrical signal;

filtering the direct current voltage from the electrical signal through a capacitor in the second conductive paths to provide a resulting electrical signal that is a function of the fluctuating voltage drop of the sensed impressed current resistance of the corrosion protection system;

amplifying the filtered electric signal that is a function of the fluctuating voltage drop of the impressed current resistance to provide an electrical signal of a constant polarity in the second conductive path;

inverting the filtered and amplified electrical signal of a constant polarity in the second conductive path; and

combining the separate signals in the two conductive paths algebraically at the summing amplifier to obtain an output signal from the summing amplifier that is a function of only the natural reference voltage of the cathodic protection system.

4,160,172

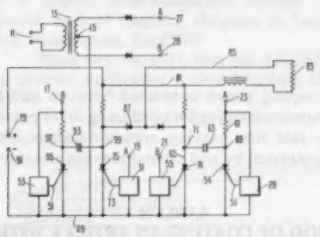
CIRCUIT FOR CONTROLLING DEMANDS OF HIGH CURRENT LOAD

Tung C. Chen, Villanova, Pa., assignor to Systematics Inc., West Chester, Pa.

Filed Jan. 9, 1978, Ser. No. 867,804
Int. Cl.[2] H03K *17/56;* **H05B** *7/144*
U.S. Cl. 307—252 M **5 Claims**

1. A circuit for controlling high current conduction providing in combination: alternating current rectifier means adapted to be connected to a source of alternating current power, including first and second output means whereat first and second pulsating half wave voltages are made available, said half wave voltages having a value of zero volts at some time during their respective half wave periods; first and second high current switching means, each having an input element, an

output element and a control element; first trigger circuit means coupled to said control element of said first high current switching means and coupled to said first output means to receive first half wave voltage therefrom to turn on said first high current switching means during said first half wave voltage period; second trigger circuit means coupled to said control element of said second high current switching means and coupled to said second output means to receive second half wave voltage therefrom to turn on said second high current switching means during said second half wave voltage period; load means; circuitry means coupling said load means to the respective input elements of said first and second high current switching means, said circuitry means adapted to be connected to a source of direct current voltage whereby when said first and second high current switching means are conducting, current will pass to said load; first and second control switching means, each having an input element, an output element and a control element; said first control switching means con-



nected to said second output means to receive said second half wave voltage therefrom to cause said first control switching means to conduct during said second half wave voltage period and to cease conducting in response to said second half wave voltage decreasing to a value of zero; and first coupling circuitry means coupling said first control switching means to said first high current switching means to turn off said first high current switching means in response to said first control switching means being turned on; and said second control switching means connected to said first output means to receive said first half wave voltage therefrom to cause said second control switching means to conduct during said first half wave voltage period and to cease conducting in response to said first half wave voltage decreasing to a value of zero; and second coupling circuitry means coupling said second control switching means to said second high current switching means to turn off said second high current switching means in response to said second control switching means being turned on.

4,160,173

LOGIC CIRCUIT WITH TWO PAIRS OF CROSS-COUPLED NAND/NOR GATES

Kiyoshi Aoki, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 9, 1977, Ser. No. 859,130

Claims priority, application Japan, Dec. 14, 1976, 51-150199; Dec. 14, 1976, 51-150203; Jan. 26, 1977, 52-6838; Jan. 26, 1977, 52-6840

Int. Cl.[2] H03K *3/286, 19/08, 19/20, 21/00*

U.S. Cl. 307—289 **13 Claims**

1. A logic circuit comprising:

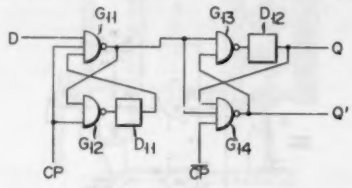
first and second cross-coupled NAND/NOR gates, said second NAND/NOR gate having a delay of output change, due to an input change, which is larger than that of said first NAND/NOR gate;

third and fourth cross-coupled NAND/NOR gates;

means for coupling the output of said first NAND/NOR gate to respective inputs of said second and third NAND/NOR gates;

means for coupling the delayed output of said second NAND/NOR gate to an input of said first NAND/NOR gate;

means for supplying a first clock pulse to respective inputs of first and second NAND/NOR gates;



means for supplying a second clock pulse having a phase substantially opposite to that of said first clock pulse to an input of at least said fourth NAND/NOR gate; and

means for coupling a logic input signal to an input of said first NAND/NOR gate.

4,160,174

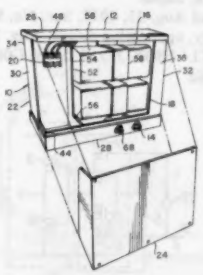
POWER CAPACITOR MOUNTING AND INDICATOR LIGHT STRUCTURE

Myron Zucker, 708 W. Long Lake Rd., Bloomfield Hills, Mich. 48013

Filed Nov. 29, 1976, Ser. No. 745,797

Int. Cl.[2] A47B *51/00*

U.S. Cl. 307—328 **13 Claims**



1. Capacitor mounting structure including an enclosure for at least one power capacitor, means for connecting an input electrical signal to the capacitor and for withdrawing an output electrical signal from the capacitor, and a catch basin within the enclosure for retaining liquid coming from the capacitor within the enclosure with the enclosure mounted in any of three mutually perpendicular positions.

4,160,175

DIFFERENTIAL THRESHOLD DETECTOR

Philip A. Trout, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 12, 1978, Ser. No. 868,970

Int. Cl.[2] H03K *5/153*

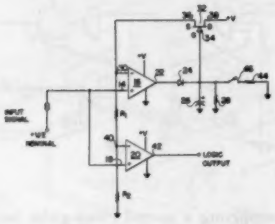
U.S. Cl. 307—358 **2 Claims**

1. An adaptive reference threshold detector for sensing a drop of predetermined magnitude in the level of an input signal from its peak value during an interval of time comprising:

a voltage follower circuit including an operational amplifier having a positive input port coupled to said input signal and an output coupled through a diode to a capacitor, whereby said capacitor charges to the maximum voltage level at the output of said voltage follower circuit and

thereby establishes a reference voltage derived from said input signal in cooperation with said voltage follower;

an FET device having its gate coupled to said capacitor and its source coupled to the negative input port of said voltage follower circuit operational amplifier in a manner such that negative feedback is applied thereto; and



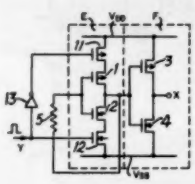
a comparator circuit having a positive input port coupled to said input signal and a negative input port coupled to the source of said FET device through a resistive divider, thereby continuously comparing said input signal with said reference level and producing a logic level output signal whenever the difference in magnitude between said input signal and said reference level exceeds a preselected value.

4,160,176

ELECTRONIC WATCH

Norio Takahashi, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Aug. 23, 1977, Ser. No. 826,986
Claims priority, application Japan, Aug. 23, 1976, 51-100429
Int. Cl.[2] H03K *3/353, 5/18;* G08B *21/00*
U.S. Cl. 307—362 **7 Claims**



1. A circuit for detecting battery voltage comprising first and second NOT circuits connected between positive and negative terminals of a battery, each of said circuits comprising a P-channel MOS transistor and an N-channel MOS transistor, means connecting the output of said first NOT circuit to the input of said second NOT transistor and resistance means interconnecting the output and input of said first NOT circuit, the output of said second NOT circuit being the output of said battery voltage connecting circuit for connection to indicating means.

4,160,177

VIBRATORY ELECTROMAGNETIC MOTOR

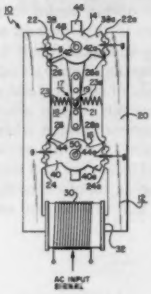
Enzo Ascoli, Lausanne, Switzerland, assignor to The Gillette Company, Boston, Mass.

Filed Oct. 3, 1977, Ser. No. 838,537
Int. Cl.[2] H02K *7/06*
U.S. Cl. 310—22 **19 Claims**

1. A vibratory electromagnetic motor comprising:

stator means having first and second pairs of opposed poles;

first and second pivotally movable armature means each with armature poles, said first armature being pivotally mounted on a first axis of rotation with said first armature poles located adjacent to said first pair of stator poles and said second armature being pivotally mounted on a second axis of rotation with said second armature poles located adjacent to said second pair of stator poles to permit said first and second armature means to syncronously move about said first and second axes in opposite directions in response to a magnetic force; and



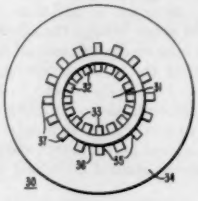
resilient coupling means connected between said first and second armature means for combining drive power generated by said first moving armature means with drive power generated by said second moving armature means.

4,160,178

METHOD OF COATING AN ARTICLE WITH A SOLVENTLESS ACRYLIC EPOXY IMPREGNATING COMPOSITION CURABLE IN A GAS ATMOSPHERE WITHOUT HEAT

James D. B. Smith, Wilkins Township, Allegheny County, and Robert N. Kauffman, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 1, 1978, Ser. No. 911,577
Int. Cl.[2] H02K *1/04;* B32B *15/08*
U.S. Cl. 310—43 **18 Claims**



1. A method of applying cured resinous material to an article, comprising the steps of:

(A) applying a solventless, insulating resin to an article, the resin containing dissolved oxygen therein and having a viscosity of between about 1 cps. and 2,000 cps. at 25° C., said resin consisting essentially of an admixture of aliphatic polyacrylic resin selected from the group consisting of diacrylates, triacrylates and their mixtures:aliphatic monoacrylic resin:epoxy resin:aromatic reactive vinyl monomer:anhydride in a weight ratio of from 10:0 to 20:0.1 to 100:0 to 120:0 to 60, said insulating resin also containing effective amounts of: organic free radical reaction stabilizer, organic free radical initiator, organic free radical accelerator, and organic co-accelerator, and

(B) contacting the resin with an inert diffusion gas selected from the group consisting of nitrogen, carbon dioxide, argon, helium, methane, hydrogen and mixtures thereof, in an amount effective to permeate into the resin to displace the dissolved oxygen in the resin to a level below

about 0.5 volume % to initiate cure without the application of heat, to provide a deep cured resinous coating on the article without metal contact catalysis.

2. The method of claim 1, wherein the free radical initiator is an organic peroxide, the free radical accelerator is an organic tertiary amine, and the organic co-accelerator is an organic sulfimide.

11. An insulated, high voltage electric motor, comprising a metal stator having slots therein surrounding a metal armature, and conducting electrical coil windings disposed within the slots of the stator, and a body of cured resinous insulation applied to and completely impregnating the electrical coil windings, the insulation comprising a cured insulating resin applied by the method of claim 2.

4,160,179
RECTIFIER AND BRUSH ASSEMBLY FOR AN ALTERNATOR

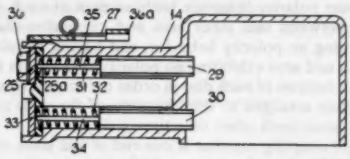
Maurice J. Allport, Stourbridge, and Herbert J. T. Cotton, Hollywood, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Oct. 18, 1977, Ser. No. 843,242

Claims priority, application United Kingdom, Oct. 23, 1976, 44096/76

Int. Cl.[2] H02K *11/00*

U.S. Cl. 310—68 R **4 Claims**



1. A rectifier and brush assembly for an alternator comprising, a rectifier having a plurality of field diodes, said field diodes having a corresponding plurality of terminals, a common electrical connector interconnecting said terminals and having an integral apertured flange, an electrically insulating brush housing contacting alternator brushes, an electrically conductive member mounted on said electrically insulating brush housing, a fixing screw securing said apertured flange to said electrically conductive members, and a biasing spring for biasing one of said alternator brushes, said electrically conductive member being electrically connected with one of said brushes and in the form of a relatively rigid detachable plate having a portion forming an abutment for said spring biasing said one of said brushes.

4,160,180
ROTOR LAMINATION SUPPORT FOR VERTICAL HYDRO-GENERATOR

Evgeny N. Vinogradov, ulitsa Belgradskaya, 6, korpus 2, kv. 45; Jury A. Ivanov, ulitsa Syzranskaya, 18, kv. 56; Nikolai A. Filatov, Moskovsky prospekt, 175, kv. 60; Viktor S. Fomichev, linia Bulvarnaya, 35, kv. 49, and Samuil A. Prutkovsky, linia Lensoveta, 73, korpus 2, kv. 67, all of Leningrad, U.S.S.R.

Filed Jul. 12, 1978, Ser. No. 923,992

Int. Cl.[2] H02K *1/22*

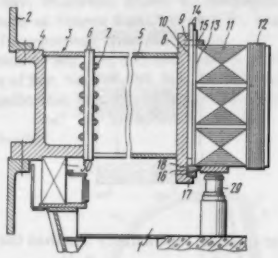
U.S. Cl. 310—157 **4 Claims**

1. A rotor of a vertical hydro-generator, comprising:

a shaft;

a frame having a hub connected with said shaft and a plurality of radial spokes attached to said hub, said frame further including a plurality of wedge strips, each said radial spoke having at least one said wedge strip secured thereto;

a rim with poles, connected to said wedge strips, each said wedge strip having on the outside of its lower portion a horizontal transverse slot and a support means supporting said rim with poles and including oppositely directed



wedges disposed in said horizontal transverse slot and partially projecting beyond this slot towards said rim.

4,160,181
METHOD FOR GENERATING AUXILIARY ELECTRIC ENERGY ON A VEHICLE

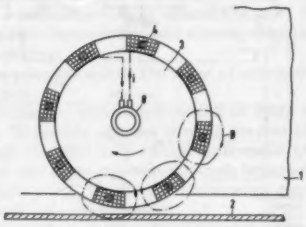
Alfred Lichtenberg, Herzogenaurach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 30, 1977, Ser. No. 829,245

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2642682

Int. Cl.[2] H02K *17/44*

U.S. Cl. 310—166 **2 Claims**



2. Apparatus for generating auxiliary electric energy for a vehicle supported by an electrodynamic support system comprising:

(a) a magnet pole wheel constructed without iron disposed in the vehicle above an electrically conducting support rail of the electrodynamic support system; and

(b) an electric generator mechanically coupled to said magnet wheel.

4,160,182
LAMINATED CORE MANUFACTURE

Yoshiaki Mitsui, Kitakyushu, Japan, assignor to Mitsui Mfg. Co., Ltd., Kitakyushu, Japan

Filed Jul. 27, 1977, Ser. No. 819,478

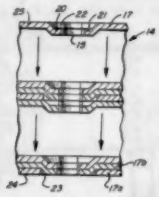
Int. Cl.[2] H02K *3/48*

U.S. Cl. 310—214 **23 Claims**

1. In a dynamoelectric device having a wound core provided with a plurality of circumferentially spaced, radially opening slots disposed in an annular array, and windings in said slots, the improvement comprising

an annular slot closure coaxial of said annular array, said slot closure being formed of magnetic material and having a

plurality of through openings disposed one each centrally of the open end of said slots and having an extent transversely to the slots substantially less than the width of the slots.

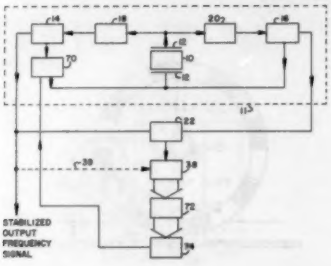


4,160,183

OSCILLATOR HAVING A QUARTZ RESONATOR CUT TO COMPENSATE FOR STATIC AND DYNAMIC THERMAL TRANSIENTS

John A. Kusters, Cupertino, Calif.; Jerry G. Leach, Snyder, Tex., and Michael C. Fischer, Santa Clara, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 26, 1978, Ser. No. 910,044
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—315 **10 Claims**



1. Signal generation apparatus comprising:

a quartz crystal resonator having a selected crystallographic orientation that is equal to (yxwl) 21.93°/33.93°±2° for providing static and dynamic thermal transient compensation, and having first and second thickness modes of vibration in response to an electric field applied thereto, vibration in each of said modes being characterized by a selected frequency-temperature deviation characteristic;

oscillator means for generating and supplying said electric field to said quartz crystal resonator, for isolating the first and second frequency signals of said first and second modes of vibration, respectively, and for shifting the phase of at least one of said first and second frequency signals; and

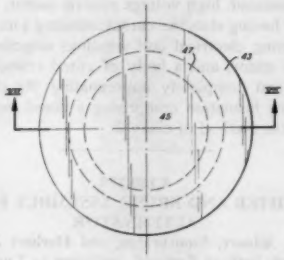
compensation means coupled to receive at least the other of said first and second frequency signals for production of a correction control signal for application to the oscillator means to control the phase shift necessary to stabilize the one of said first and second frequency signals for temperature induced frequency variations, the other of said first and second frequency signals received by the compensation means being representative of the temperature of said quartz crystal resonator and used to generate the correction control signal.

4,160,184

PIEZOELECTRIC ACTUATOR FOR A RING LASER

Bo H. G. Ljung, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Jan. 9, 1978, Ser. No. 868,067
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—328 **14 Claims**



1. An improved piezoelectric actuator for controlling path length in a ring laser gyroscope comprising:

(a) a plurality of piezoelectric discs, arranged in a stack, each of said piezoelectric discs having a central region exhibiting a first polarity and a circumferential area exhibiting an opposite polarity behavior with an area in each of said discs between said inner area and circumferential area exhibiting no polarity behavior, and having annular cutouts in said area exhibiting no polarity behavior in the top and/or bottom of each disc in order to increase flexibility, said discs arranged so that the areas of the same polarity lie adjacent each other on adjacent discs;

(b) a rigid coupling member at one end of said stack of discs;

(c) a flexible mirror having a central portion, a circumferential portion and a flexible annular area between said central portion and circumferential portion, at the other end of said stack;

(d) means for holding said coupling member discs and flexible mirror together such that said coupling member is rigidly attached to both the central region and circumferential area of the disc at said one end, the circumferential areas of adjacent discs are attached to each other, the central areas of adjacent discs are attached to each other, the central portion of said mirror is attached to the central region of the disc at the other end and the circumferential portion of said mirror is attached to the circumferential area of the disc at said other end; and

(e) means for coupling a voltage to the faces of said discs.

4,160,185

RED SENSITIVE PHOTOCATHODE HAVING AN ALUMINUM OXIDE BARRIER LAYER

Charles M. Tomasetti, Leola, and Arthur F. McDonie, Lancaster, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 14, 1977, Ser. No. 860,562
Int. Cl.[2] H01J *39/06;* B05D *5/12*
U.S. Cl. 313—94 **7 Claims**

1. In a method of making an electron emissive electrode including a supporting substrate of nickel and a base layer of antimony, comprising the steps of:

(a) baking said electrode at a temperature from 260° C. to 285° C. at a pressure of less than 10^{-4} torr; then

(b) sensitizing said base layer by exposing a surface portion thereof to the vapors of at least one alkali metal at a temperature lower than said bake temperature at a pressure of less than 10^{-4} torr; wherein the improvement comprises the step of:

forming between said nickel substrate and said antimony layer an aluminum oxide film for preventing the alloying of said nickel substrate with said antimony layer during bake and

for providing oxygen to oxidize said electrode and increase the red photosensitivity of said electrode.

6. An electron emissive electrode comprising:

a supporting substrate of nickel;

a base layer of antimony on said substrate, said base layer being sensitized with the vapors of at least one alkali metal; and

an aluminum oxide film between said nickel substrate and said antimony layer for preventing alloying of said nickel substrate with said antimony layer at processing temperatures in the range from 260° C. to 285° C. and for providing oxygen to oxidize said electrode and increase the red photosensitivity of said electrode.

4,160,186

CLOSURE STRUCTURE OF ELECTRIC DISCHARGE TUBES

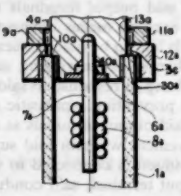
Béla Kerekes, Budapest, Hungary, assignor to Egysült Izzólámpa és Villamossági Reszvenytarsasag, Budapest, Hungary

Filed Nov. 14, 1977, Ser. No. 851,596

Claims priority, application Hungary, Jan. 6, 1977, EE 2471

Int. Cl.[2] H01J *61/36*

U.S. Cl. 313—220 **9 Claims**



1. An electric discharge tube comprising

a tubular bulb means formed from ceramic material having first and second open end portions;

a first closing member fitted substantially over at least one of said open end portions of said bulb means;

a second closing member fitted over a portion of said one of said open end portions and spaced from said first closing member by a distance such that capillary action will occur therebetween; and,

said first and second closing members being so spaced from said one end portion of said bulb means that capillary action between said closure members and said end portion will occur.

4,160,187

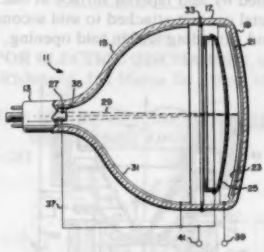
POST-DEFLECTION ACCELERATION CRT SYSTEM

Donald L. Say, Waterloo; Harry E. Smithgall, and Kenneth Speigel, both of Seneca Falls, all of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 629,143, Nov. 5, 1975, which is a continuation of Ser. No. 504,999, Sep. 11, 1974, abandoned. This application Sep. 23, 1976, Ser. No. 725,793

Int. Cl.[2] H01J *29/80, 39/20*

U.S. Cl. 313—408 **3 Claims**



1. Improvement in a system relating to a color cathode ray tube of the post-deflection acceleration type, said tube having an envelope wherein an electron gun assembly is oriented to direct a plurality of scanning electron beams through a multi-apertured color-selection electrode member having a given potential supplied thereto from an external source to provide defined beam focusing upon discrete areas of a spatially related patterned cathodoluminescent screen having a metallic backing film disposed thereover, said screen having a higher potential applied thereto from a second external source thereby effecting a definitive voltage differential (ΔV) between said color-selection electrode and said screen, said system improvement comprising:

a screen potential within the range of substantially 20 to 40 kilovolts;

a color-selection electrode potential or more than substantially 72 percent and less than 85 percent of said screen voltage to effect said voltage differential (ΔV) therebetween, said color-selection electrode being substantially of the same potential as that of the terminal electrode of said electron gun assembly; and

definitive electron barrier means effected within said tube by said backing film, said metallic film being of specific uniform thickness within the range of substantially 3,000 to 5,000 angstroms adheringly disposed as a single layer on the surface of said screen toward said color-selection electrode to provide a barrier for the secondary electrons prevalent in substantially the region between said screen and said color-selection electrode, the specific thickness of said barrier providing a defined voltage penetration threshold directly relatable to said voltage differential (ΔV), such (ΔV) being substantially equal to or less than the voltage penetration threshold of said film to provide improved contrast and color purity of the display and minimize background luminescence of the screen resultant from spurious impingement of secondary electrons thereon.

4,160,188

ELECTRON BEAM TUBE

Gilbert N. Butterwick, Leola, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 23, 1976, Ser. No. 680,003

Int. Cl.[2] H01J *29/02, 29/48, 29/46*

U.S. Cl. 313—446 **4 Claims**

1. In an electron beam tube apparatus having a face section, neck section, and cathode section constructed to generate an

electron beam in a vacuum, the improvement in said cathode section comprising:

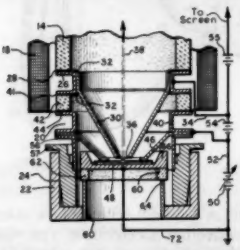
a cathode assembly including,

a first electrically conductive member attached to said neck section,

an electrically insulating member attached to said first member,

a second electrically conductive member attached to said insulating member and constructed at one end to form a tapered surface, all of said members being constructed and attached in such a manner as to form an opening surrounded by said tapered surface at one end,

a resilient metal contact attached to said second conductive member and extending within said opening, and



a field electrode attached to said first conductive member and positioned within said opening; and

a cap including,

a first electrically conductive portion slidably engaged with said tapered surface to form a vacuum seal therewith,

an electrically insulating portion attached to said first portion,

an electrically conductive plate attached to said insulating portion, and

a cathode attached to said electrically conductive plate in such manner that said cathode will abuttably engage said resilient contact in response to the slidable engagement of said first conductive portion with said tapered surface.

4,160,189

ACCELERATING STRUCTURE FOR A LINEAR CHARGED PARTICLE ACCELERATOR OPERATING IN THE STANDING-WAVE MODE

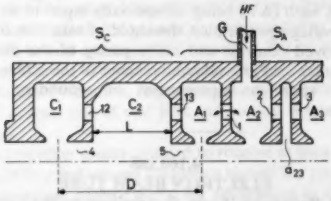
Duc Tien Tran, and Dominique Tronc, both of Buc, France, assignors to C.G.R.-Mev, Buc, France

Filed Mar. 28, 1978, Ser. No. 891,058

Claims priority, application France, Mar. 31, 1977, 77 09809

Int. Cl.[2] H01J *25/10*

U.S. Cl. 315—5.41 **14 Claims**



1. An accelerating structure for a linear charged particle accelerator comprising at least an accelerating section formed by a series of resonant cavities operating in the stationary-wave mode; a complementary cavity section disposed upstream said accelerating structure in the path of said particles, said complementary cavity section being joined to and electromagnetically coupled with said accelerating section, said cavities of the accelerating section, which comprise axial orifices for the passage of the beam, being electromagnetically coupled with one another; and means for injecting a hyperfrequency signal into said accelerating sections; said complementary section comprising at least a first resonant cavity and a second resonant cavity electromagnetically coupled with one another, said second resonant cavity having a length L such that the distance D separating the interaction spaces of the first cavity of the complementary section and of the first cavity of the accelerating section is equal to:

$$D=(2k+n/2)]\pi\beta\lambda_o \quad (1)$$

when n and k are integers at least equal to 1, β is the mean reduced velocity v/c of the charged particles, and λ_o is the free-space wavelength of the H.F. signal injected into the accelerating structure, said second cavity of said complementary section, which has predetermined dimensions, being electromagnetically coupled with said first cavity of the complementary section and said first cavity of the accelerating section in such a manner that the H.F accelerating field is zero in said second cavity of the complementary section.

4,160,190

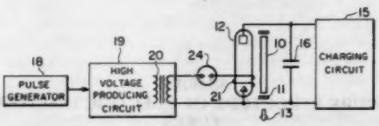
CIRCUIT COMPRISING AN AIR GAP FOR DRIVING A LASER

Kazutoyo Akase, and Isao Kobayashi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1977, Ser. No. 838,836

Int. Cl.[2] H05B *41/32*

U.S. Cl. 315—168 **2 Claims**



1. In a driving circuit used together with a flash lamp comprising a pair of discharge electrodes and supplied with an exciting voltage, said circuit being for energizing a laser device placed adjacent to said lamp in response to a trigger pulse and comprising a transformer having a pair of output terminals, means for supplying said trigger pulse to said transformer to develop a pulse voltage across said output terminals, means for connecting one of said output terminals to one of said discharge electrodes, exciting means connected to the other of said output terminals and to be placed outwardly of said lamp for causing a discharge for energizing said laser device to occur in said flash lamp in response to said pulse voltage, and suppress means for preventing a parasitic voltage from being developed across said output terminals as a result of said discharge, the improvement wherein said suppress means comprises a pair of conductors connected to said exciting means and said other output terminal, said conductor pair opposing each other with an air gap therebetween, said air gap being capable of allowing said pulse voltage to pass therethrough and preventing said parasitic voltage from being supplied from said other output terminal to said exciting means.

4,160,191

SELF-SUSTAINING PLASMA DISCHARGE DISPLAY DEVICE

A. David Hausfeld, 1833 S. Ocean Dr., Hallandale, Fla. 33009

Filed Dec. 27, 1977, Ser. No. 864,259

Int. Cl.[2] H05B *37/00, 39/00, 41/00*

U.S. Cl. 315—169.4 **50 Claims**

1. A plasma discharge display assembly comprising in combination:

a sealed enclosure;

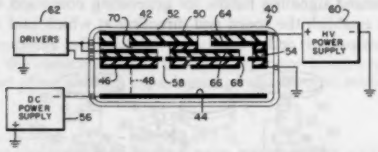
a gas disposed in said enclosure at a predetermined pressure P;

cathode means disposed in said enclosure for generating electrons;

cathodoluminescent target means, disposed within said enclosure and spaced from said cathode means, said target means generating light in response to electrons striking said target means;

electrode means disposed between said cathode means and target means and including at least one passageway for conducting electrons between said cathode means and said target means, said electrode means further including anode means disposed at a distance d from said cathode means, for maintaining a selfsustained discharge from said cathode means to said anode means, control means for selectively controlling the conduction of electrons through said passageway, and means for limiting substantial positive ion space charge within said passageway;

wherein electron mean free path through said passageway is such that substantial positive ion space charge can form within said passageway and the product Pd is that product where a selfsustained plasma discharge occurs between said cathode means and said anode means when the electrical potential between the cathode means and anode means is substantially equal to the Paschenminimum voltage of said gas.

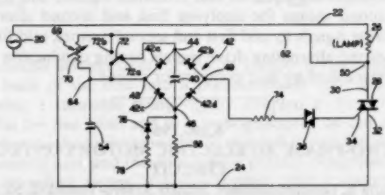


4,160,192

DELAYED TURN-OFF SWITCHING CIRCUIT

Raymond J. McAllise, 1812 Bruce St., Canal Fulton, Ohio 44614

Filed Jun. 3, 1977, Ser. No. 803,137
Int. Cl.[2] G05F *1/00*; H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—194 **5 Claims**



1. A lamp dimmer circuit having delayed turn-off, comprising:

a voltage source;

a load adapted to be energized from said source;

a gate controlled switch operative for controlling energization of said load, said controlled switch including a pair of output terminals connected in circuit with said source and said switch, and a gate for controlling an on-off state of said switch;

means derived from said voltage source for supplying a control current to the gate of said switch;

a turn-off capacitor connected between said gate current means and said gate;

diode means connected in series with said turn-off capacitor and said gate for causing unidirectional current flow through said capacitor for operating said gate controlled switch in a one-half wave mode of operation;

dimmer means for controlling a firing angle of said gate controlled switch, said dimmer means including an RC circuit means having variable resistance means, said RC circuit means connected in circuit with said turn-off capacitor and said gate current means;

switch means selectively by-passing the variable resistance means of said RC circuit, said switch means being closed for by-passing said variable resistance means in a delayed turn-off mode of operation and being open in a dimmer mode of operation; and

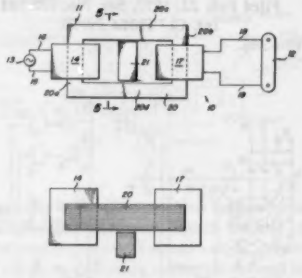
means for enabling said one-half wave mode operating means only during the delayed turn-off mode.

4,160,193

METAL VAPOR ELECTRIC DISCHARGE LAMP SYSTEM

Abraham W. Richmond, 162 Haven Dr., West Melbourne, Fla. 32901

Filed Nov. 17, 1977, Ser. No. 852,552
Int. Cl.[2] H05B *41/16, 41/24*
U.S. Cl. 315—281 **18 Claims**



1. A metal vapor electric discharge lamp system, comprising, a low-medium-high pressure metal vapor electric discharge lamp having a rated full radiation power in the range of about 200 to 400 watts per inch of said lamp, and transformer and control means including, a transformer comprising, a primary winding energized on alternating current electrical supply, a secondary winding loosely magnetically coupled with said primary winding by a main magnetic core portion of said transformer and connected in series electrical circuit with said metal vapor electric discharge lamp, having the latter consist essentially the load in said circuit, and magnetic shunt core means, and means for said magnetic shunt core means to be controlled to move to and from any one of at least two positions relative to said main magnetic core portion, said magnetic shunt core means in a first of said positions being substantially fully magnetically isolated from said main magnetic core portion to have said main magnetic core portion link magnetic flux from said primary winding with said secondary winding, and said magnetic shunt core means in the other of said positions, including a second position, being within the magnetic field of said main magnetic core portion and forming a magnetic shunt path with said main magnetic core portion physically between said primary and secondary windings to have said main magnetic core portion link a reduced amount of magnetic flux from said primary winding with said secondary winding, and said transformer and said low-medium-high pressure metal vapor electric discharge lamp being interrelated with one another according to properties so that with said magnetic shunt core means being in said first position said secondary winding is energized on operation of said transformer to have a relatively high power output level for striking an arc at a relatively high voltage across said metal vapor electric discharge lamp, whereupon voltage across said lamp sharply drops and current through said lamp sharply increases and is limited by impedance of said transformer, and with continued operation of said metal vapor electric discharge lamp, current through said lamp is decreased as voltage across

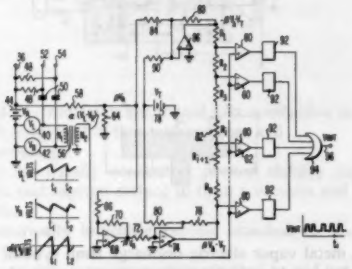
said lamp increases for current and voltage across said metal vapor electric discharge lamp to stabilize at a relatively high radiation power level of operation of said metal vapor electric discharge lamp, and so that upon movement of said magnetic shunt core means from said first position to said second position relative to said main magnetic core portion in response to operation of said control means, operation of said transformer and said metal vapor electric discharge lamp is continued and said secondary winding is energized to have a relatively low power output level and said metal vapor electric discharge lamp accordingly thereafter stably operates at a radiation power level being less than about 70% full radiation power of said lamp.

4,160,194

SYSTEM AND METHOD FOR KEYING VIDEO INFORMATION TO ELECTRON BEAM DEFLECTION

Charles H. Anderson, Rocky Hill, and Frank J. Marlowe, Kingston, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,511
Int. Cl.[2] H01J *29/70*
U.S. Cl. 315—366 **6 Claims**



1. A system for determining the position of an electron beam with respect to points on a screen of a cathodoluminescent display device, said system comprising:

means for generating at least one reference voltage proportioned to an instantaneous anode voltage; and

means for comparing a reference voltage with the electron beam deflection voltage for the display device, said comparing means including at least one comparator having one of its inputs connected to the reference voltage generating means and the other input connected to the deflection voltage and having its output connected to a monostable multivibrator.

4,160,195

TAPE CONTROL APPARATUS

Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 23, 1977, Ser. No. 836,145
Claims priority, application Japan, Sep. 28, 1976, 51/116170
Int. Cl.[2] B65H *77/00*
U.S. Cl. 318—7 **15 Claims**

1. Tape control apparatus comprising:

first and second reel members for supplying and taking up tape;

first and second drive motors coupled to said first and second reel members, respectively, for applying oppositely directed torques to said first and second reel members, thereby bi-directionally driving tape between said reel members and applying tension to the driven tape;

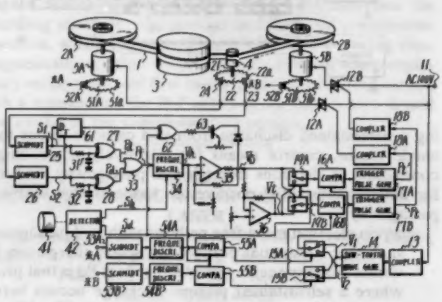
speed detecting means for detecting the transport speed of said tape and for generating a speed control signal proportional to said detected tape speed;

torque voltage generating means responsive to said speed control signal for generating first and second torque voltages determinative of said torques respectively applied to said first and second reel members by said first and second drive motors, said first and second torque voltages changing differentially with respect to each other as said speed control signal changes;

first and second motor drive means responsive to said first and second torque voltages, respectively, for applying first and second drive signals to said first and second drive motors to control the torques applied by said drive motors to said reel members, whereby said tape is transported at a substantially constant speed;

means for applying said first and second torque voltages to said first and second motor drive means;

command signaling means for generating command signals to establish the speed and direction at which said tape is transported; and



means responsive to said command signals for adjusting said first and second torque voltages applied to said first and second motor drive means to differentially change the torques applied by said first and second drive motors to said first and second reel members;

said first and second motor drive means comprising means for generating alternating reference signals, comparator means for comparing said first and second torque voltages applied thereto to said alternating reference signals to determine the respective locations in the cycles of said reference signals whereat said first and second torque voltages are equal to said reference signals, and first and second means for applying first and second alternating drive signals to said first and second motors, said first and second alternating drive signals having conduction angles established by said comparator means.

4,160,196

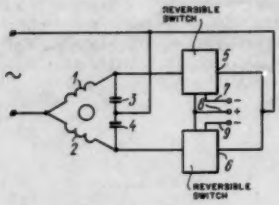
TWO-PHASE AC ELECTRIC MOTOR CONTROL CIRCUIT

Sagdulla K. Ismatkhodzhaev, Massiv Severo-Vostok-2, 51, kv. 56; Salikh Z. Usmanov, proezd Morozova, 3, kv. 7, both of Tashkent; Mirmakhmud A. Mirsagatov, poselok Salar, ulitsa Khamza, 13, Tashkentskaya oblast Ordzhonikidzevsky raion; Nasim G. Dzhabarov, Ts-13, dom 11, kv. 35, Tashkent-128; Makhirdzhan Takhirdzhanov, ulitsa Kurskaya, 15, Tashkent, and Anvardzhan F. Mumindzhanov, ulitsa Raskovoi, 44, Tashkent, all of U.S.S.R.

Continuation of Ser. No. 576,096, May 8, 1975, abandoned. This application Jun. 22, 1977, Ser. No. 809,046
Int. Cl.[2] H02P *1/40*
U.S. Cl. 318—749 **2 Claims**

1. A control circuit of a two-phase AC electric motor with windings and two series capacitors delta-connected, a power source with two terminals, the midpoint of said windings being connected to one terminal of said power source, switching means with two shunt switching elements, each shunt switching element being connected between the other terminal of said source and a separate junction of said windings and said capacitors, the leads of said windings being connected to said capaci-

tors and being brought to the other terminal of the power source, through said shunt switching elements, the midpoint of said capacitors being connected to said other terminal of said source, the capacitance of each said capacitor being equal to the rated phase-shifting capacitance of said electric motor.

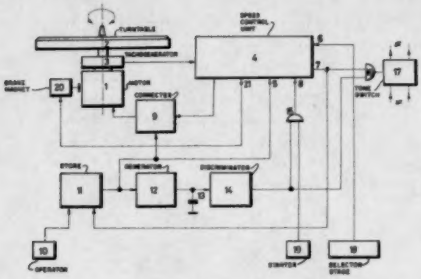


4,160,197

CIRCUIT ARRANGEMENT FOR RECORD PLAYERS PERFORMING THE SETTING BACK OF THE DISC INTO A PRE-DETERMINED START POSITION

György Rothman; György Babos; Mária Gyarmati nee Hardik; Árpád Hegedüs, and Ottó Rofa, all of Budapest, Hungary, assignors to Mechanikai Laboratorium Hiradastechnikai Kiserleti Vallalat, Budapest, Hungary

Filed Jan. 24, 1978, Ser. No. 871,790
Int. Cl.[2] G05B *13/02*
U.S. Cl. 318—396 **3 Claims**



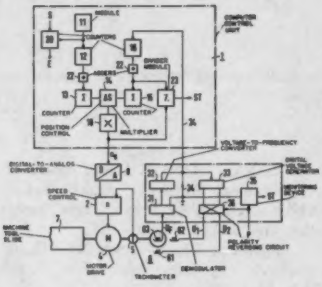
1. A circuit arrangement for record players performing the setting back of the disc into a predetermined start position comprising a turntable being rigidly coupled to its driving motor on the one hand and to a tachogenerator on the other hand whereas the tachogenerator is coupled to one input of a speed control unit, and the circuit arrangement comprises also a start-operating means, a brake magnet, and a correcting means being coupled over its first input to the first output of the said speed control unit and over its output to the operating input of the said motor, and the second output of the said speed control unit is connected to the operating input of the said brake magnet whereas the improvement consists in that the third output (7) of the said speed control unit (4) is connected to the first input of a store (11), the output of the said store (11) is connected to one output of a controllable current generator (12) as well as to one input of the said correcting means (9) and one input of the said speed control unit (4), the output of the current generator (12) is connected on the one hand to one plate of a storing capacitor (13) the other plate of which being connected to a constant potential such as the common potential of the circuit arrangement and on the other hand to the input of a threshold level discriminator (14) the output of which being connected to one input of a logical gate circuit (15) whereas the output of the said gate circuit (15) is connected to the third input (8) of the said speed control unit (4), and the operating means (10) of the circuit arrangement is connected to the second input of the said store (11) whereas its start-operating means (19) is connected to the other input of the said gate circuit (15).

4,160,198

NUMERICALLY-CONTROLLED MACHINE TOOL

Günter Brömer, Spardorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,283
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2649115
Int. Cl.[2] G05B *23/02*
U.S. Cl. 318—565 **3 Claims**



1. In a numerically-controlled machine tool including means for adding incremental set values, which depend on a programmed input, and incremental actual values, generated by a self-balancing distance measuring system, at defined time intervals to a set distance value and an actual distance value, and means for forming a set speed value for a controller of an input drive by the difference between the set distance value and the actual distance value, said difference being proportional to a lag distance, said self-balancing distance measuring system comprising an inductive measuring transducer which is fed from a primary side thereof and which generates a secondary error voltage on the secondary side thereof, the magnitude and polarity of which depends on the position of a flux vector generated on said primary side relative to the position of a secondary winding of said transducer, and means for generating pulse signals which are proportional to the secondary error voltage for servoing the flux vector in the direction toward balance and measuring the actual value of the distance travelled by said secondary winding, the improvement comprising,

said measuring transducer including means for briefly rotating said flux vector through defined angles in sensing intervals of an incremental actual-value interrogation, and means for detecting polarity changes in said secondary error voltage.

4,160,199

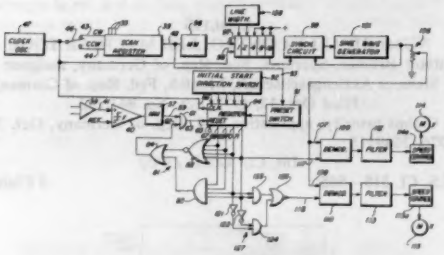
LINE OR PATTERN FOLLOWING SYSTEM

Francis G. Bardwell, Elmhurst, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Jul. 5, 1977, Ser. No. 812,787
Int. Cl.[2] G05B *19/36*
U.S. Cl. 318—577 **14 Claims**

1. A system for tracing a line or pattern, comprising a plurality of angularly spaced light-sensitive devices, arranged in an array, which has a reference point, a first drive motor for moving said array in a first direction, a second drive motor for moving said array in a second direction which is at substantially a right angle to said first direction, said array being adapted to be positioned adjacent said line or pattern and an image of an edge of the line or pattern falling on said array and making an angle θ with said reference point, means for sequentially sampling said devices, and means responsive to said

reference point and to said sampling means and powering said first drive motor at a speed which is a function of sine θ and

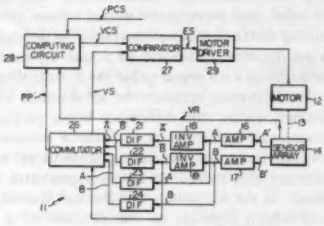


powering said second drive motor at a speed which is a function of cos θ.

4,160,200
SERVO CONTROL APPARATUS

Tomoatsu Imamura; Shigeyuki Araki; Nobuo Iwata, and Masahiro Yoshimi, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 27, 1977, Ser. No. 810,208
Claims priority, application Japan, Jun. 29, 1976, 51/76854; Oct. 2, 1976, 51/118855
Int. Cl.[2] G05B *5/01*
U.S. Cl. 318—616 **13 Claims**

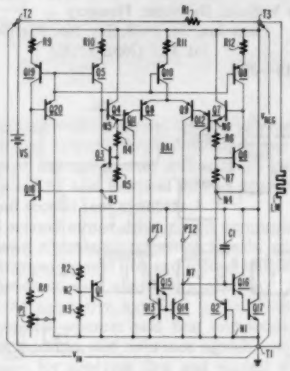


1. A servo control apparatus comprising:
a servo motor;
a light source;
a photosensor array including first and second identical photosensors, the first photosensor being continuously illuminated by the light source;
an occluder disc formed with at least one light transmitting aperture, the disc being rotatably driven by the motor between the light source and the second photosensor to alternately cover and uncover the second photosensor, the second photosensor producing electrical position signals in response to said covering and uncovering thereof, the position signals having a D.C. component;
computing means responsive to the position signals and a position command signal for producing a velocity command signal to drive the motor and disc from an initial position to a position corresponding to the position command signal;
differentiating means for differentiating the position signals to produce a velocity signal;
comparator means responsive to the velocity signal and the velocity command signal for producing an error signal corresponding to a difference therebetween and feeding the error signal to the motor to drive the motor;
sensor means responsive to an output signal of the first photosensor;
intensity control means responsive to the sensor means for adjusting an intensity of the light source so that the output signal of the first photosensor has a predetermined value; and
amplifier means connected between the second photosensor and the computing means, the intensity control means adjusting a bias voltage applied to the amplifier means to remove the D.C. component from the position signals in accordance with the output signal of the first photosensor.

4,160,201
VOLTAGE REGULATORS

Adel A. A. Ahmed, Clinton Township, Hunterdon County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 8, 1978, Ser. No. 914,236
Int. Cl.[2] G05F *1/56, 1/60*
U.S. Cl. 323—8 **11 Claims**



6. A voltage regulator of the type wherein the regulated voltage is with reference to a multiple of the difference between first and second voltages, the first voltage being the offset potential provided between first and second nodes by a first circuit connected therebetween, which first voltage equals (m+n) times the offset potential across a first forward-biased semiconductor junction operated at a relatively high current density, and the second voltage being the offset potential provided between third and fourth nodes by a second circuit connected therebetween, which second voltage equals m times the offset potential across a second forward-based semiconductor junction operated at a relatively low current density, m and n being positive numbers, improved in that said first circuit includes:
a transistor having an emitter electrode at said first node, having a base electrode, having an emitter-base junction corresponding to said first semiconductor junction, and having a collector electrode connected for permitting collector current flow and direct coupled to said second node; and divider means for dividing the potential appearing between said first and second nodes for application between said first node and the base electrode of said transistor, which divider means includes first and second resistive elements respectively connecting said first node and said second node to the base electrode of said transistor.

4,160,202

ANALOGUE AUTOMATIC VOLTAGE CONTROLLER

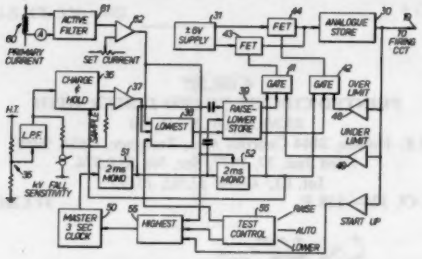
Barry K. James, Solihull, and David R. Terry, Nettleham, both of England, assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 21, 1977, Ser. No. 853,788

Claims priority, application United Kingdom, Dec. 15, 1976, 52240/76

Int. Cl.[2] B03C *3/68*

U.S. Cl. 323—24 4 Claims



1. A control circuit for an electrostatic precipitator, comprising an analogue store for providing an output voltage representative of a desired precipitator electrode voltage, switch means for selectively increasing or decreasing the voltage in the analogue store, a switch control circuit connected with the switch means for selecting an increase or a decrease in the stored voltage, and a sensing circuit adapted to be responsive to a falling electrode voltage to provide an output signal for switching said switch control circuit to cause a decrease in the stored voltage, said sensing circuit including a comparator to which are supplied a voltage indicative of the electrode voltage and a delayed sample of that voltage.

4,160,203

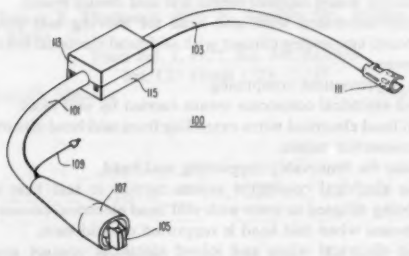
AUTOMOTIVE SPARK INDICATOR

Richard G. Volk, York, Pa., assignor to K-D Manufacturing Company, Lancaster, Pa.

Filed Dec. 12, 1977, Ser. No. 859,435

Int. Cl.[2] F02P *17/00*

U.S. Cl. 324—15 10 Claims



1. A spark indicator apparatus for use in detecting automotive ignition spark at various points in an auto ignition system comprising:

electrical transmission means for electrically connecting a one of said various ignition system points to automotive ground, said transmission means having an interruption therein providing a spark air gap;

means for encasing said spark air gap, said encasing means including a transparent housing completely surrounding said spark air gap, a straight channel passing through said housing, said channel having two larger diameter sections and a smaller diameter section separating said two larger diameter sections, and a pair of abuttment shoulders, situated one each at an interface of said smaller diameter channel section with one of said two larger diameter sections; and

means for venting said spark air gap through said encasing means, said venting means traversing at least one change in direction.

4,160,204

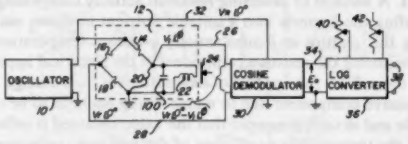
NON-CONTACT DISTANCE MEASUREMENT SYSTEM

William A. Holmgren; John S. Hasling, and Richard W. Denny, all of Colorado Springs, Colo., assignors to Kaman Sciences Corporation, Colorado Springs, Colo.

Filed Nov. 11, 1974, Ser. No. 522,509

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—207 12 Claims



1. Apparatus for measuring distance to an object, comprising:

means for generating an AC signal at a predetermined substantially constant frequency;

distance-related impedance means connected to said signal generating means and excited by said constant frequency AC signal for indicating object distance by variations in its impedance characteristic, said distance-related impedance means including at least first and second interconnected impedance elements, said first impedance element being inductive means whose impedance varies in proportion to object distance, said second impedance element having a selectively set impedance value which combines with said first impedance element to produce a resultant impedance characteristic for said distance-related impedance means which is substantially a logarithmic function of object distance over a first range of distance, said first range commencing at substantially zero distance and increasing up to an ascertainable point, whereby the magnitude of the electrical signal generated across said distance-related impedance means is logarithmically proportional over said first range to object distance;

wherein said AC signal is a high frequency signal;

wherein said second impedance element is capacitive means;

wherein said second impedance element is connected in parallel with said first impedance element;

including means responsive to the electrical signal generated across said distance-related impedance means for generating therefrom an output signal linearly proportional over said first range to object distance; and,

wherein said linear output generating means comprises means for generating a selected bias signal and a log converter circuit; said log converter circuit being responsive to the electrical signal generated across said distance-related impedance means to generate said output signal linearly proportional over said first range to object distance; said log converter circuit further being responsive to said selected bias signal to produce an offset in the remaining portion of said output signal, which represents object distances outside of said first range, to render said remaining signal portion also substantially linearly proportional to object distance.

4,160,205

DETECTION OF BACTERIAL ACTIVITY

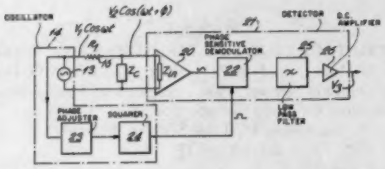
Geoffrey Hobbs; Alfred C. Jason, both of Aberdeen, and John C. S. Richards, Old Aberdeen, all of Scotland, assignors to National Research Development Corporation, London, England

Filed Oct. 19, 1977, Ser. No. 843,493

Claims priority, application United Kingdom, Oct. 19, 1976, 43334/76

Int. Cl.[2] G01R *27/02*

U.S. Cl. 324—65 R **16 Claims**



1. A method of detecting bacterial activity comprising inoculating the bacteria into a suitable nutrient medium; maintaining this culture at a substantially constant temperature; and monitoring the resistive component of the electrical impedance of the culture for a period of time sufficient for a change in said resistive component due to metabolising bacteria to be detectable and in such a manner that the value obtained is influenced by the temperature coefficient of the resistive component to a degree which is equivalent to a change in temperature of not more than ±0.01K.

4,160,206

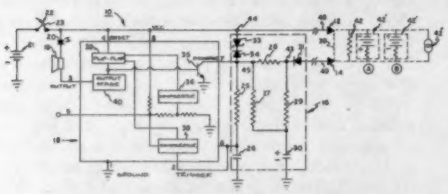
AUDIBLE VOLTAGE-IMPEDANCE TESTER

Victor Bojarski, Bridgeport, Conn., assignor to Bengt Berendonk, Whittier, Calif.

Filed Dec. 14, 1977, Ser. No. 860,598

Int. Cl.[2] G01R *15/12, 19/16, 27/00, 31/02*

U.S. Cl. 324—73 R **25 Claims**



15. An audible voltage-impedance tester comprising:

(A) a battery with a constant voltage and with a reference terminal;

(B) means for removably contacting across an unknown voltage or impedance source, said means having first and second probes, the first probe switchably interconnected to the battery;

(C) input means interconnected to at least the second probe of the unknown source contacting means and to the reference terminal of the battery and including a resistor and a capacitor serially connected to each other for electrically sensing the current passing through the unknown source;

(D) a multi-vibrator interconnected to the resistor and capacitor and powered by the battery, the multi-vibrator having an output with a signal generated thereon that changes state when the capacitor of the input means charges and discharges between two voltage states, the first state being a first fraction of the battery voltage and the second state being a second, smaller, fraction of the battery voltage; and

(E) an electroacoustic transducer connected to the output of the multi-vibrator for generating a sound representative of the output signal of the multi-vibrator;

whereby the audible tester senses resistances or voltages without coupling the unknown source to the battery in a manner so as to be in series with the multivibrator, but connects the unknown source to the battery so as to influence the charge and discharge rate of the resistor-capacitor network of the input module, thereby generating a distinct output by the multi-vibrator which drives the electroacoustic transducer.

4,160,207

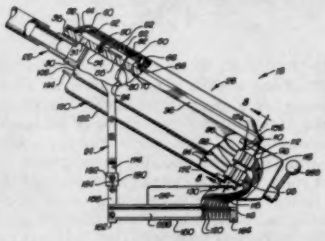
PRINTED CIRCUIT BOARD TESTER WITH REMOVABLE HEAD

Fred E. Haines, 2444 Cabrillo Ave., Torrance, Calif. 90501

Filed Jun. 27, 1977, Ser. No. 810,574

Int. Cl.[2] G01R *31/02, 15/12*

U.S. Cl. 324—158 F **17 Claims**



1. In a printed circuit board circuit tester having a testing head,

head electrical wires and joined head contact means extending into said head,

said head electrical contact means being fitted in a non-conducting environment supported in the head,

support means within said head adapted to support a circuit board to be tested,

said head electrical contact means extending through said non-conducting environment to a position adjacent said circuit board support means and said circuit board,

means associated with said head for moving said circuit board into testing contact with said head electrical contact means,

the improvement comprising:

head electrical connector means carried by said head,

said head electrical wires extending from said head electrical connector means,

a base for removably supporting said head,

base electrical connector means carried in said base and being adapted to mate with said head electrical connector means when said head is supported on said base,

base electrical wires and joined electrical contact means extending from said base connector means into said base,

said base electrical contact means being exposed through said base for connection to an electrical supply to test said circuit board,

upwardly extending spaced arms on one side of said base having means to slidably engage with and support said head adjacent one end thereof,

means extending from said head to respectively slidably engage said arms, and

head stop means extending from an opposite side of said base to slidably engage with said head when said means extending from said head slidably engages with said arms,

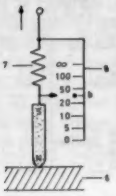
said stop means and said arms being adapted to support said head on said base.

4,160,208

METHOD OF CALIBRATING MAGNETIC THICKNESS GAUGES

Erich A. Steingroever, Bonn, and Hans F. Nix, Cologne, both of Fed. Rep. of Germany, assignors to Elektro-Physik, Hans Nix & Dr. -Ing E. Steingroever KG., Cologne, Fed. Rep. of Germany

Filed Jan. 27, 1976, Ser. No. 652,669
Int. Cl.[2] G01R *35/00*
U.S. Cl. 324—202 **8 Claims**



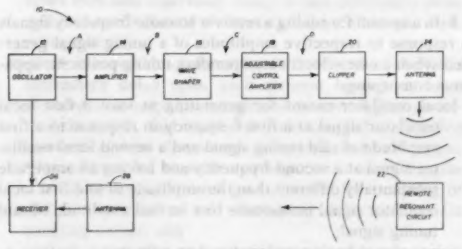
1. Method of calibrating magnetic thickness gauges of the type having a direct reading scale and being equipped with at least one movable magnetized pole piece for contact with a layer to be measured, said layer being supported on a base composed of a material capable of exerting force on said pole piece when said magnetized pole piece is in contact with said layer which is a function of the thickness of the supported layer, comprising the steps of placing said magnetized pole piece in contact with a test sheet composed of a material having a uniformity distributed composition throughout its thickness which exerts a lesser magnetic force on said pole piece than the same thickness of said base material, said force being the equivalent of the force exerted by said base material when supporting a layer of known thickness, and adjusting the attractive force of said pole piece to obtain the reading on said scale indicative of said known thickness.

4,160,209

RESONANT CIRCUIT EXCITATION METHOD AND APPARATUS

Thomas F. Thompson, 3891 E. Amazon Dr., Eugene, Oreg. 97405

Filed Jul. 1, 1977, Ser. No. 812,133
Int. Cl.[2] H04B *1/59, 7/145*
U.S. Cl. 325—64 **3 Claims**



2. A method of exciting a resonant circuit operable at one frequency through the use of a signal producing means operable at a lower frequency, where the resonant circuit responds to an edge of a periodic signal having a predetermined time-level slope extending over a required pedetermined signal-level range, said method comprising

generating, with such a signal-producing means, and at said lower frequency, a periodic electrical signal having an edge characterized by a time-level slope smaller than said predetermined time-level slope,

amplifying said signal,

by said amplifying, producing an amplified signal having an edge exhibiting said predetermined time-level slope and extending at least over said required predetermined signal-level range, and

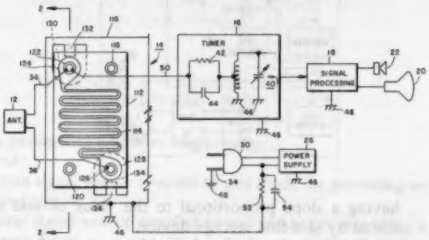
transmitting said amplified signal to said resonant circuit.

4,160,210

PRINTED CIRCUIT IMPEDANCE TRANSFORMATION NETWORK WITH AN INTEGRAL SPARK GAP

Thomas E. Molinari, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 30, 1977, Ser. No. 829,169
Int. Cl.[2] H04B *1/18*
U.S. Cl. 325—362 **10 Claims**



1. Apparatus for coupling an antenna network to an RF signal processing circuit, comprising:

a printed circuit board having a first conductor formed on one side thereof and coupled between said antenna network and said signal processing circuit;

a second conductor comprising a planar metal member positioned in a fixed relationship with respect to said first conductor to form a transmission line having characteristics selected to match the impedances of said antenna network and said RF signal processing circuit; and

discharging means including a third conductor extending from one of said first and second conductors toward the other of said first and second conductors to form a spark gap therebetween for discharging excessively high energies developed at said antenna network.

4,160,211

METHOD AND INSTRUMENT FOR MEASURING THE SENSITIVITY OF A RADIO RECEIVER

Glen R. Wittrock, Sioux Falls, S. Dak., assignor to Sencore, Inc., Sioux Falls, S. Dak.

Filed Sep. 8, 1977, Ser. No. 831,513
Int. Cl.[2] H04B *17/00*
U.S. Cl. 325—363 **2 Claims**

1. An instrument for use in measuring the sensitivity of a radio receiver comprising

a radio frequency generator providing a radio frequency carrier,

an audio frequency generator providing a constant frequency audio signal,

modulator means for modulating said radio frequency carrier with an audio signal applied thereto,

means for sequentially applying said audio signal to said modulator means,

means coupling the output signal from said modulator means to the radio frequency input of said receiver,

detecting means for providing a dc output voltage proportional to the level of an audio frequency signal applied thereto,

means coupling the audio output signal from said receiver to said detecting means,

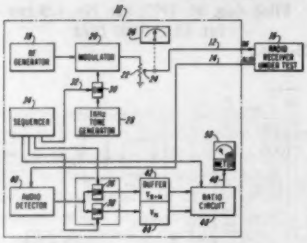
first and second signal storage devices,

switching means coupling the output of said detecting means to said first signal storage device only during the period when said audio signal is applied to said modulator means and coupling the output of said detecting means to said second signal storage device only during the period when said audio signal is not applied to said modulator means,

means responsive to the signals stored by said storage devices for displaying the ratio of the signals respectively stored by first and second signal storage devices,

means for adjusting the level of the output signal from said modulator means applied to said RF input to set said ratio at a predetermined value,

ramp wave generating means for providing a ramp wave



having a slope proportional to the value of said signal stored by said first storage device,

means for displaying the level of said output signal applied to said RF input,

said means for displaying the ratio comprising,

means for developing a dc voltage signal when the voltage level of said ramp wave is greater than the voltage level of said signal stored by said second storage device,

means for periodically resetting said ramp wave generating means at a rate sufficient to prevent the voltage of said ramp wave from exceeding the voltage stored by said first storage device,

meter means for displaying the average value of a variable dc voltage applied thereto, and

means coupling said dc voltage signal to said meter means.

4,160,212

RADIO FREQUENCY RECEIVER HAVING SERIALLY COUPLED HETERODYNING STAGES, EACH STAGE HAVING FILTERS WITH DIFFERENCE CENTER FREQUENCIES

William S. Barquist, Jr., Solvang, and Robert S. Hutcheon, Goleta, both of Calif., assignors to Raytheon Company, Lexington, Ky.

Filed May 26, 1977, Ser. No. 800,994
Int. Cl.[2] H04B *1/26*
U.S. Cl. 325—432 **4 Claims**

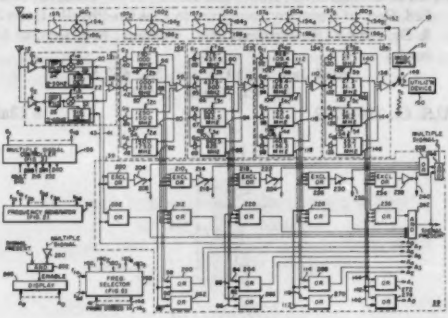
1. A radio frequency signal receiver for determining the frequency of a received signal, comprising:

(a) a plurality of serially coupled frequency converter stages having successively smaller bandwidths, each one of said frequency converter stages including:

(i) a plurality of bandpass filters adapted to pass signals within a first predetermined band of frequencies, each one of the plurality of filters having a different center frequency and being adapted to pass signals within a different portion of the first predetermined band of frequencies; and

(ii) heterodyning means for converting the frequency of a signal passed by any one of the plurality of bandpass filters to a frequency within a second, smaller predetermined band of frequencies, such signal being fed to the next succeeding smaller bandwidth stage;

(iii) a plurality of signal detector means coupled to the output of a corresponding one of the plurality of bandpass filters, for providing detection signals indicating which one or ones of the bandpass filters passes the received signal; and



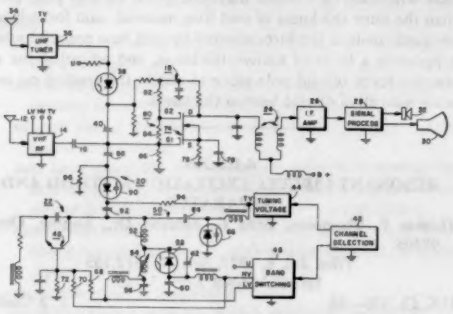
(b) frequency measuring means, responsive to the detection signals of the signal detector means, for providing an indication of the frequency of the received signal.

4,160,213

MIXER INJECTION VOLTAGE COMPENSATION CIRCUIT

George W. Carter, Greenfield, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,780
Int. Cl.[2] H04B *1/26*
U.S. Cl. 325—439 **6 Claims**



1. In a system for tuning a receiver to radio frequency signals in response to respective amplitudes of a tuning signal generated when a user selects corresponding tuning positions, apparatus comprising:

local oscillator means for generating at least a first local oscillator signal at a first frequency in response to a first amplitude of said tuning signal and a second local oscillator signal at a second frequency and having an amplitude substantially different than the amplitude of said first local oscillator signal in response to a second amplitude of said tuning signal;

mixer means having an input and an output;

first coupling means including a first varactor diode serially coupled between said local oscillator means in response to said second amplitude of said tuning signal, said second injection signal for developing at said input of said mixer means a first injection signal at said first frequency in response to said first amplitude of said tuning signal and a second injection signal at said second frequency and having an amplitude substantially equal to the amplitude of said first injection signal; and

second coupling means for coupling said radio frequency signals to said input of said mixer;

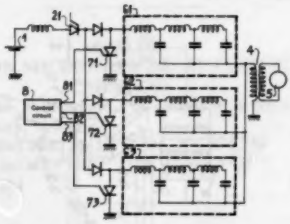
said mixer means combining said radio frequency signals and said injection signals to develop an intermediate frequency signal at said output thereof.

4,160,214

MODULAR MODULATOR FOR RADAR TRANSMITTERS

Lucien Colin, and André Chesnel, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 23, 1977, Ser. No. 827,110
Claims priority, application France, Aug. 27, 1976, 76 25956
Int. Cl.² H03K *1/00*
U.S. Cl. 328—65 **7 Claims**



1. A modular modulator for use in a transmitter of the type including a power supply, a modulator generating pulses, a separating circuit coupling power from said power supply to said modulator, a transmission tube, and a coupling circuit carrying pulses from said modulator to said transmission tube, said modular modulator comprising:

a plurality of elementary delay cells, each having first and second terminals and each having a predetermined delay associated therewith, said elementary delay cells being coupled in switchable parallel relationship between said separating circuit and said coupling circiut, said second terminal of each of said elementary delay cells being coupled to said coupling circuit;

a diode element associated with each of said elementary delay cells, coupling said separating circuit to said elementary delay cell and arranged with polarity such that power flows from said separating circuit to said elementary delay cell, and not from said elementary delay cell to said separating circuit;

an electronic switching element associated with each of said elementary delay cells, each element having an input electrode, an output electrode and a control gate associated therewith, said input electrode coupled to said first terminal of said elementary delay cell and said output terminal coupled to said coupling circuit such that the activation of said control gate controls the coupling of said first terminal of said elementary delay cell to said coupling circuit; and

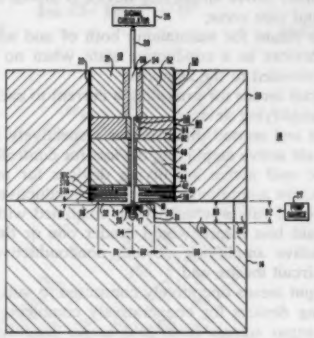
a control circuit for generating gate control pulses, said control circuit having outputs coupled to each of said control gates of said electronic switching elements such that the relative timing of said gate control pulses controls the coupling of each of said elementary delay cells to said coupling circuit, permitting the independent control of loading and discharge of each of said elementary delay cells in order to generate pulses having desired pulse width and desired timing.

4,160,215

SINGLE DIODE UPPER SIDEBAND TERMINATED PARAMETRIC AMPLIFIER

Edward C. Niehenke, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1978, Ser. No. 900,955
Int. Cl.² H03F *7/04*
U.S. Cl. 330—4.9 **9 Claims**



1. A parametric amplifier comprising:

a diode,

an input signal source coupled to said diode for providing an input signal,

a pump signal source coupled to said diode for providing a pump signal,

said diode amplifying said input signal through interaction of said input signal and said pump signal and generating thereby an upper sideband signal and an idler signal,

waveguide means for coupling said pump signal to said diode,

a terminating waveguide coupled to said waveguide means at the place of coupling said diode to said waveguide means,

said terminating waveguide having predetermined dimensions to provide a onehalf wavelength operating condition at the upper sideband signal frequency and a cutoff operating condition at said idler signal frequency to suppress said upper sideband signal and said idler signal respectively from entering said waveguide means and

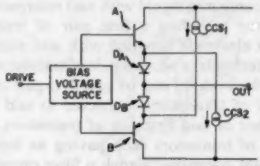
an approximate one-quarter wavelength operating condition at the pump signal frequency to provide efficient coupling of said diode at the pump signal frequency to said waveguide means.

4,160,216

APPARATUS FOR ELIMINATING ON-OFF TRANSITIONAL GAIN VARIATIONS IN CLASS AB, B AND C ACTIVE ELEMENT AMPLIFIERS

Barry W. Thornton, 2340 Selma St., Sacramento, Calif. 95815

Filed Jan. 16, 1978, Ser. No. 870,011
Int. Cl.² H03F *3/26*
U.S. Cl. 330—267 **18 Claims**



1. A high fidelity audio amplifier comprising:

input means to the amplifier adapted to receive an input signal to be amplified;

a pair of cooperating active amplifying devices having their respective control inputs operatively connected to said input means and connected to drive a common output in response to an input signal in a mode wherein one active amplifying device is driven more conductive in response to changes of input signal from a zero level while the other active amplifying device is driven less conductive, and vice versa;

bias means for maintaining both of said active amplifying devices in a conductive state when no input signal is provided to the amplifier;

circuit means for providing a current to each of said active amplifying devices;

first and second diode means respectively associated with said active amplifying devices for controlling the current to said active amplifying devices for maintaining said active amplifying devices in a conductive state for input signal values which, when combined with the bias from said bias means would render one or the other of said active amplifying devices nonconductive without said circuit means; and

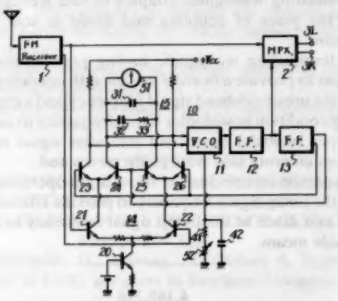
output means operatively connected to said active amplifying devices for cooperatively combining the respective output signals from said active amplifying devices to provide an amplified output signal from the amplifier.

4,160,217

PHASE LOCKED LOOP CIRCUIT

Mitsuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 780,243, Mar. 22, 1977, abandoned.
This application Aug. 8, 1978, Ser. No. 931,987
Claims priority, application Japan, Apr. 1, 1976, 51-36525
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—8 **1 Claim**



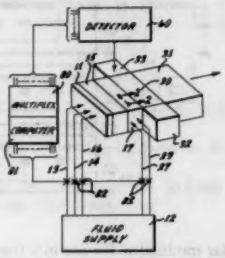
1. A phase-locked loop circuit comprising a voltage controlled oscillator providing an output signal and having a free-running frequency that may vary with time; a phase comparator comparing the phase of a reference signal with the phase of a compared signal which is derived from said output signal of the voltage controlled oscillator for providing a D.C. control voltage in dependence on a variation of the phase relation of said compared signal with said reference signal, said phase comparator including a first pair of transistors each having an input electrode supplied with said reference signal and an output electrode, a second pair of transistors connected to said output electrode of one of said first pair of transistors, and a third pair of transistors connected to said output electrode of the other of said first pair of transistors, said second and third pairs of transistors each having an input electrode supplied with said compared signal; a filter circuit connected to said phase comparator between output electrodes of said second and third pairs of transistors and to said voltage controlled oscillator and through which said control voltage is applied to said voltage controlled oscillator so as to shift the actual frequency of said output signal from the oscillator in respect to said free-running frequency for eliminating said variation of the phase relation; indicator means including a meter whose center is null and which is connected in parallel with said filter circuit for indicating the value and polarity of said D.C. control voltage, and manually actuable means connected with said voltage controlled oscillator for adjusting said free-running frequency of the voltage controlled oscillator in the sense, and to the extent indicated by said meter for eliminating said control voltage due to a variation of said free-running frequency with time.

4,160,218

LASER MONITOR AND CONTROL SYSTEM

Frederic H. White, III, Simi, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 23, 1977, Ser. No. 809,234
Int. Cl.[2] H01S *3/095, 3/13, 3/101*
U.S. Cl. 331—94.5 P **11 Claims**



1. In a chemical laser wherein a plurality of different fluids are discharged into a laser cavity to establish a laser active medium, there being a plurality of different fluid feed paths provided to the laser, the laser cavity including plural reflector means establishing an optical cavity and including means for extracting an output beam from the cavity, the improvement comprising: detection means disposed in relation to the extracting means for detecting the contour of the beam as extracted in representation of the beam profile in the cavity along a direction of fluid flow in the cavity; and

control means connected to the detection means for controlling at least one fluid as passing through the respective feed paths to obtain a change in a laser gain profile, for avoiding passage of the laser beam in the cavity through a portion of negative gain.

4,160,219

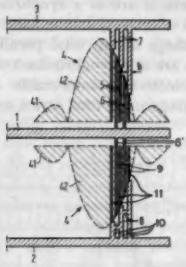
TRANSDUCER ELECTRODES FOR FILTERS OR DELAY LINES UTILIZING SURFACE WAVE PRINCIPLES

Wilhelm Kuny, Gruenwald, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 1, 1977, Ser. No. 783,837
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1976, 2618210
Int. Cl.[2] H03H *9/04, 9/30, 9/26;* H01L *41/10*
U.S. Cl. 333—151 **8 Claims**

1. Transducer electrodes on piezoelectric substrates for passband filters or delay lines utilizing surface waves wherein the transducers are in the form of interdigital structures with longitudinally weighted electrode fingers (5, 6, 9, 11) the width of which is $\lambda_0/4$ and the distance between centers of adjacent fingers is $\lambda_0/2$, characterized in that outside of the active overlap zone (4) the electrode fingers (5, 11) are fed by feeders

(7, 10) with a width of $b \simeq \lambda_0/2 = v/2f_0$ where λ_0 = the wavelength of the surface wave at the center frequency f_0; and



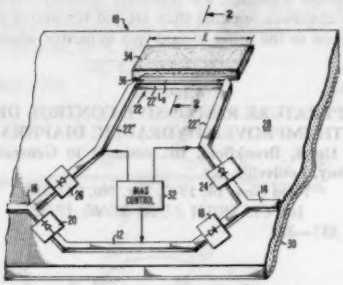
v = propagation velocity of the surface wave, and the distance between centers of adjacent feeders (7, 10) is λ_0.

4,160,220

PRECISION MICROWAVE DELAY CIRCUIT AND METHOD

Vitaly Stachejko, Willingboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 23, 1978, Ser. No. 871,760
Int. Cl.[2] H01P *1/18, 11/00, 3/08*
U.S. Cl. 333—161 **13 Claims**



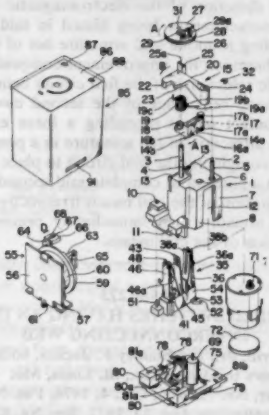
1. In a microwave delay circuit, in combination:
a transmission line having a given impedance;
an input terminal coupled to said line to which a signal at a given microwave frequency, which it is desired to delay, may be applied;
an output terminal spaced from said input terminal, also coupled to said line; and
resistive means having an electromagnetic radiation resonance at a microwave frequency sufficiently different than said given microwave frequency so that negligible microwave energy at said given frequency is attenuated by said resistive means, said resistive means being positioned adjacent a portion of said transmission line between said input and output terminals, and having a dielectric constant and a permeability sufficiently close in value so as to have negligible effect on said given impedance, whereby said resistive means delays a microwave signal at said given frequency, when such a signal is applied to said input terminal and is propagating along said portion of said transmission line, an amount dependent upon the position of said resistive means with respect to said transmission line and upon the values of said dielectric constant and permeability and with negligible impedance mismatch and negligible attenuation of said microwave signal.

4,160,221

UNIQUE TIMING DEVICE CONSTRUCTION

Isamu Ohara, Okayama; Tsutomu Muranaka, Tamano, and Hideo Eizumi, Okayama, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 4, 1977, Ser. No. 839,302
Claims priority, application Japan, Oct. 4, 1976, 51-133552[U]; Oct. 12, 1976, 51-137260[U]
Int. Cl.[2] H01H *3/42*
U.S. Cl. 335—68 **11 Claims**



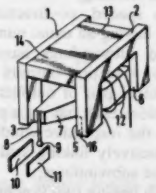
1. A timing device comprising:
a contact assembly;
a contact actuator for actuating said contact assembly;
an electromagnet for resetting said contact actuator in response to a reset signal;
a driven gear containing a cam surface thereon controlling movement of said contact actuator;
a motor for driving said driven gear;
means for coupling said motor to said driven gear;
a molded frame to which said contact assembly, said contact actuator, said electromagnet, said means for coupling and said motor are attached;
a housing covering said molded frame; and
a base member to which said electromagnet is attached, said molded frame being partially sandwiched and fixed between said base member and electromagnet.

4,160,222

MONOSTABLE ELECTROMAGNETIC RELAY WITH PERMANENT MAGNETIC BIAS

Hans-Werner Reuting, Peine, Fed. Rep. of Germany, assignor to Elmeg-Elektro-Mechanik Gesellschaft mit beschränkter Haftung, Peine, Fed. Rep. of Germany

Filed Jul. 1, 1977, Ser. No. 812,338
Int. Cl.[2] H01H *51/22*
U.S. Cl. 335—85 **16 Claims**



1. In an electromagnetic relay having two magnetic circuits

which include respectively at least one pole shoe per circuit, permanent magnet means common to the two circuits and being coupled to the pole shoes, an armature movably disposed to assume positions of abutment with one or the other one of the two pole shoes thereby completing respectively a first one and a second one of the two magnetic circuits, the relay having in addition spring contact means, the armature being provided with means for engaging the spring contact means, the relay further being provided with coil means to obtain electromagnetic energization to place the armature into a position of abutment with one or the other one of the pole shoes depending upon the direction of th electromagnetic energization, said spring contact means being biased in said positions of abutment tending to move said armature out of either of said positions of abutment, the improvement comprising:

the magnetic reluctance of the first circuit being larger than the magnetic reluctance of the second circuit and said spring contact means providing a force exceeding the magnetic attraction of the armature in a position of abutment for completing the first circuit to place the armature always in a position to complete said second circuit upon de-energization of the coil means irrespective of the position the armature had immediately preceding the de-energization of the coil means.

4,160,223

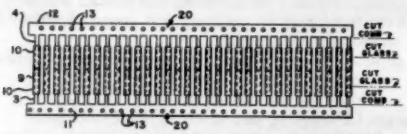
PLURAL REED SWITCHES HAVING AN INTEGRAL, INTERCONNECTING WEB

Vaughan Morrill, Jr., and Stanley F. Jackes, both of St. Louis, Mo., assignors to Morex, Inc., St. Louis, Mo.

Division of Ser. No. 729,005, Oct. 4, 1976, Pat. No. 4,055,888. This application Aug. 22, 1977, Ser. No. 826,727

Int. Cl.[2] H01H *1/66*

U.S. Cl. 335—152 **1 Claim**



1. An article of manufacture comprising a multiplicity of reed switches each having a glass envelope and two, electrically conductive reeds each with a seal section fused into said envelope and a reed section projecting from said envelope, said switches being in parallel, spaced, side by side relation to one another, and an electrically conductive web integral with and of a piece with all of the lead sections of reeds projecting from one end of said switches.

4,160,224

TRANSFORMER

Donald W. Owen, 334 Foreman Ave., Norman, Okla. 73069

Filed May 11, 1977, Ser. No. 795,754

Int. Cl.[2] H01F *21/12*

U.S. Cl. 336—147 **14 Claims**

1. A transformer comprising:

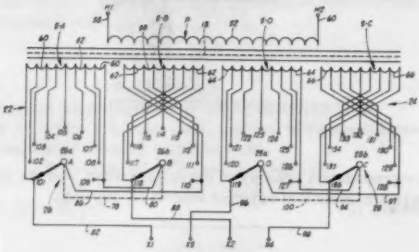
a first electrical winding;

two physically spaced, co-directionally wound inductive subwindings having an equal number of turns therein and each of said subwindings having a plurality of first through n + 1 section outputs connected thereto with each consecutive pair of outputs defining first through n winding sections each having a predetermined number of turns within the respective winding section;

means for inductively linking said first winding with said two inductive subwindings;

a tandem switch having two synchronously operative wiper contacts, each wiper contact being in coaction with a respective plurality of first through n + 1 selectively connectable contacts which are connected to a respective one of said first through n + 1 section outputs for a respective one of said subwindings; and

output terminals connected to said contacts whereby, when said wiper contacts are at a synchronized first position relative to said selectively connectable contacts, said two inductive windings are in total parallel, and when said wiper contacts are at a synchronized n + 1 position relative to said selectively connectable contacts, said two inductive windings are in total series, and when said wiper



contacts are at intermediate positions relative to said selectively connectable contacts, said two inductive windings are in a series-parallel-series configuration in which the paralleled sections are asymmetrically positioned in relation to said first electrical winding whereby the sections of a first one of said two inductive windings, which sections are those in parallel with sections of the other of said two inductive windings, are relatively spatially closer to said first electrical winding than are the respective paralleled sections to the other of said two inductive windings.

4,160,225

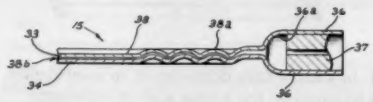
TEMPERATURE RESPONSIVE CONTROL DEVICE WITH IMPROVED HYDRAULIC DIAPHRAGM

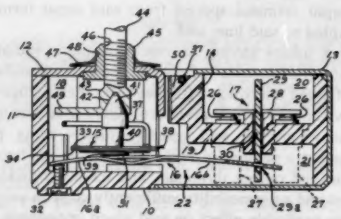
Paul T. Durst, Brookfield, Ill., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 14, 1977, Ser. No. 851,010

Int. Cl.[2] H01H *37/38, 37/40, 37/42*

U.S. Cl. 337—321 **4 Claims**





1. A temperature responsive control device comprising:

(a) a housing;

(b) electrical switching means within said housing for making and breaking an electric circuit;

(c) a temperature sensitive expansible member including a hydraulic diaphragm located within said housing, said hydraulic diaphragm comprising two plates joined to-

gether at their outer edges and connected by a fluid filled capillary tube to a remote temperature-sensing means, each of said plates including a first raised portion extending inwardly from the edge thereof, said plates being joined together with said first raised portions in juxtaposition to form a channel directly in the said diaphragm, said diaphragm being adapted to produce mechanical movement through expansion and contraction in accordance with the direction and extent of the temperature changes experienced by the remote temperature-sensing means, said capillary tube being connected directly to said hydraulic diaphragm by receipt of said capillary tube in said channel and securing said capillary tube therein;

(d) a spring mechanism mounted within said housing, said spring mechanism including a first portion engageable by said diaphragm and a second portion engaging said switching means, said spring mechanism transferring said mechanical movement of said diaphragm to effect the opening and closing of said switching means; and

(e) manually adjustable means engaging said diaphragm for moving said diaphragm with respect to said spring mechanism so as to vary the amount of mechanical movement of said expansible member required to cause the opening and closing of said switching means.

4,160,226

SNAP-ACTING THERMALLY RESPONSIVE ACTUATORS

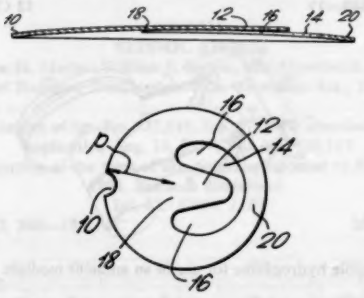
John C. Taylor, 9 Homefield Park, Ballasalla, Castletown, Isle of Man

Continuation-in-part of Ser. No. 639,856, Dec. 11, 1975, abandoned. This application Jan. 31, 1978, Ser. No. 874,012

Claims priority, application United Kingdom, Dec. 12, 1974, 53847/74; Oct. 30, 1975, 45024/75

Int. Cl.[2] H01H *37/52*

U.S. Cl. 337—379 **20 Claims**



1. A snap-acting thermally responsive bimetallic actuator comprising a bimetallic sheet member having an aperture with an outer perimeter and an inner perimeter defining a tongue free at one intermediate two lobe portions of said aperture, said inner perimeter and arcuate portions of said outer perimeter smoothly merging at rounded ends of the aperture adjacent the tongue root, an area of said member surrounding said tongue and in relation to which said tongue at least in part is generally centrally disposed having been deformed in a die pressing operation to conform in shape to a die of domed configuration, said domed area being such as to reverse its curvature with a snap action with change in temperature, the width of the domed area surrounding said tongue measured radially from the centre of the domed area being greatest in the region of the tongue root, and the length of the tongue being greater than the width of the tongue as measured at the mid-point of the length of the tongue.

4,160,227

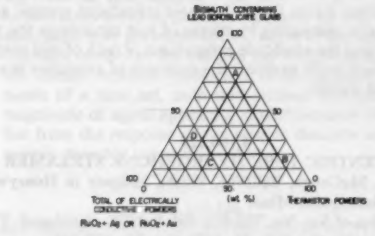
THERMISTOR COMPOSITION AND THICK FILM THERMISTOR

Akira Ikegami; Hiromi Tosaki; Jun Yamada; Teruo Mozume, all of Yokohama; Ichiro Tsubokawa, Fujisawa, and Kiyoshi Sakashita, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1977, Ser. No. 778,954

Int. Cl.[2] H01C *7/10*

U.S. Cl. 338—22 R **10 Claims**



1. A thermistor composition comprising a thermistor characteristic powder consisting of a reaction product obtained by solid phase reaction of MnO_2, CoO and NiO, a bismuth-containing lead borosilicate glass frit, an electrically conductive powder selected from the group consisting of a mixture of silver powder and ruthenium oxide powder and a mixture of gold powder and ruthenium oxide powder, characterized in that a mixing ratio of the thermistor characteristic powder, the glass frit and the electrically conductive powder is in the area of the qualrilateral ABCD in the accompanying triangular diagram of FIG. 1 and the amount of ruthenium oxide powder in the electrically conductive powder is 15–95% by weight of the total weight of the electrically conductive powder, with the vertexes A, B, C and D of the quadrilateral ABCD being the points showing the following compositions:

Thermistor characteristic powder (% by weight)		Electrically conductive powder (% by weight)	Glass frit (% by weight)
A	20	10	70
B	70	10	20
C	30	50	20
D	20	50	30

4,160,228

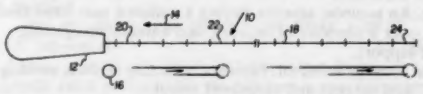
METHOD AND APPARATUS FOR TESTING MARINE SEISMIC CABLES

Larry J. Hix, Plano; Phillip W. Wise, Richardson, and David H. Bennyhoff, Plano, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 651,894, Jan. 23, 1976, abandoned. This application Mar. 1, 1977, Ser. No. 773,376

Int. Cl.[2] G01V *1/38*

U.S. Cl. 340—7 R **2 Claims**



1. A method of testing a marine seismic cable of the type having a plurality of electro-acoustic transducer groups disposed therealong, each of said groups having a common output comprising the steps of:

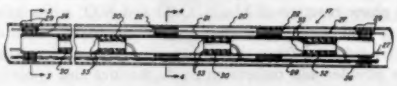
(a) positioning an acoustic energy source at a substantially fixed location in a body of water;
(b) energizing said source so as to inject repetitive acoustic pulses into the water;
(c) towing said marine seismic cable past said energy source in a normally deployed condition along a course such that the amplitude of the resultant output signal of each of said plurality of transducer groups resulting from directly travelling, non-reflected waves varies substantially with distance from said source;
(d) recording said varying output signals from said directly travelling waves for each of said transducer groups; and
(e) visually comparing by means of said recordings the polarity and the amplitude progression of each of said output signals in order to detect the existence of anomalies in said output signals.

4,160,229

CONCENTRIC TUBE HYDROPHONE STREAMER

Ronald B. McGough, Bellevue, Wash., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 703,493, Jul. 8, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,316
Int. Cl.[2] G01V *1/38*
U.S. Cl. 340—7 R **16 Claims**



1. In hydrophone streamer apparatus having an elongated hollow jacket with means at one end for connection to a marine vessel, and along which are located spaced hydrophone transducer elements for producing electrical signals indicative of pressure variations in the medium surrounding the streamer, improved mechanical isolation means for effecting two stages of isolation between the transducer elements and the jacket comprising:

a complaint tubular member positioned within the jacket and having an outer diameter smaller than the inner diameter of the jacket;

a plurality of compliant support devices between the inner surface of the jacket and the outer surface of said tubular member at spaced locations therealong for maintaining said tubular member in a generally central position within the jacket, each support device comprising at least three separated elements spaced around said tubular member; and

compliant mounting means for supporting a plurality of spaced transducer elements within said tubular member so that individual transducer elements are located between adjacent support devices.

4,160,230

ACOUSTIC ANTENNA

Philippe H. Cluzel, Six-Fours-Les-Plages, France, assignor to Etat Francais, France

Filed Feb. 10, 1977, Ser. No. 767,293
Claims priority, application France, Mar. 8, 1976, 76 06457
Int. Cl.[2] H04B *13/00*
U.S. Cl. 340—9 **12 Claims**

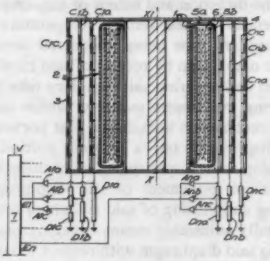
1. An acoustic antenna having a widened pass band extending over a plurality of octaves, said antenna comprising:

a support;

an acoustic reflector, having a reflecting surface, enveloping said support and supported thereby;

a plurality of piezoelectric transducers arranged forwardly of said acoustic reflector in the direction of reception for cooperating therewith, said transducers being disposed on a plurality of columns located at respective different distances from said acoustic reflector, at the respective intersections of a plurality of surfaces extending parallel to said reflecting surface with a plurality of planes extending perpendicular to said reflecting surface;

sensitivity compensation means for reducing the relative sensibilities of said transducers so that the sensitivity of each transducer spaced more distant from the reflector is reduced relative to the sensitivity of each transducer spaced closer to said reflector; and



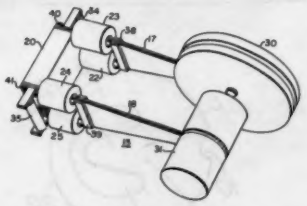
signal combining means for forming listening channels, said signal combining means having a plurality of inputs and the outputs of all said sensitivity compensations means corresponding to all the columns of transducers located in each plane perpendicular to said reflecting surface being connected in parallel to the said inputs of said signal combining means.

4,160,231

LOW FREQUENCY DIPOLE HYDROPHONE TRANSDUCER

John H. Thompson; George R. Douglas, both of Pittsburgh, Pa., and Charles R. Wilson, Glen Burnie, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 19, 1973, Ser. No. 352,820
Int. Cl.[2] H04B *13/00*
U.S. Cl. 340—11 **12 Claims**



1. A dipole hydrophone for use in an ambient medium comprising:

(A) a coupling member,

(B) a first magnetostrictive multilaminar arm portion connected to said coupling member;

(C) a second magnetostrictive multilaminar arm portion connected to said coupling member;

(D) each of said arm portions including an end defining a plurality of legs;

(E) means for establishing a magnetic biasing flux in said legs;

(F) winding means disposed about said legs;

(G) a radiation target connected to the other end of said first arm portion and responsive to ambient medium particle velocity to bend said arm portion in response thereto, to provide a corresponding signal in its associated winding means;

(H) a counterbalancing mass connected to the other end of said second arm portion and being constructed to present a substantially smaller area to ambient medium particle

velocity, normal to its associated arm portion, than that of said radiation target;

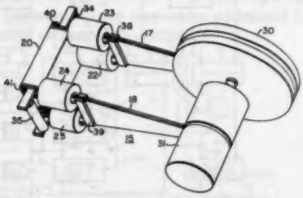
(I) said first and second arm portions being connected to said coupling member such that said winding means are located between said connection and radiation target for said first arm portion, and between said connection and counterbalancing mass for said second arm portion.

4,160,232

LOW FREQUENCY DIPOLE HYDROPHONE TRANSDUCER

Charles R. Wilson, Glen Burnie, and Raymond U. Sims, Ellicott City, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 19, 1973, Ser. No. 352,821
Int. Cl.² H04B *13/00*
U.S. Cl. 340—11 **9 Claims**



1. A dipole hydrophone for use in an ambient medium comprising:

(A) a first magnetostrictive multilaminar arm portion;

(B) first winding means coupled to said arm portion;

(C) a radiation target connected to said arm portion and responsive to ambient medium particle velocity to bend said arm portion in response thereto, to provide a corresponding signal in said winding means; and

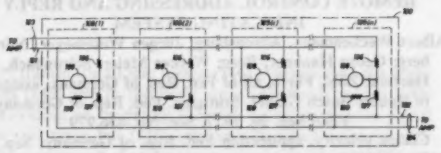
(D) means for cancelling signals caused by mechanical movement of said hydrophone.

4,160,233

SEISMIC ARRAY

William H. Mayne; William S. Hawes, and Algernon S. Badger, all of Houston, Tex., assignors to Geosource Inc., Houston, Tex.

Continuation of Ser. No. 727,019, Sep. 27, 1976, abandoned. This application Aug. 16, 1977, Ser. No. 825,117
The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.
Int. Cl.² G01V *1/20*
U.S. Cl. 340—15.5 MC **20 Claims**



1. A seismic array which comprises:

a plurality of seismic detector connection points;

a seismic detector at each seismic detector connection point;

a weighting resistor at each seismic detector connection point, said weighting resistor having one end thereof connected to one output of the seismic detector;

a damping resistor at each seismic detector connection point, said damping resistor being connected across the outputs of the seismic detector, the parallel combination of the weighting resistor and the damping resistor at each seismic detector connection point being substantially the same for all seismic detector connection points in the array;

a pair of wires which interconnects the seismic detector connection points in the array and which emerges from one end of the array, the first wire of said pair being connected to the second terminal of the weighting resistor at each seismic detector connection point and the second wire of said pair being connected to the other output of each seismic detector at each seismic detector connection point;

an amplifier which is connected to the pair of wires emerging from the array; and

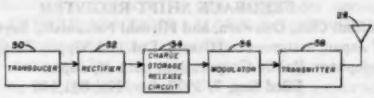
a feedback network, including a feedback resistor which is associated with the amplifier, the ratios of the value of the feedback resistor to the value of the weighting resistors at the seismic detector connection points defining the elements of a ratio set, each said element determining the magnitude of signal appearing at the output of the amplifier from the response of the seismic detector at a given seismic detector connection point.

4,160,234

ABNORMAL TIRE CONDITION SENSING SYSTEM

Donald J. Karbo, Shaker Heights; David A. Betts, Euclid, and Lyle A. Pauer, Rocky River, all of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 29, 1976, Ser. No. 671,471
Int. Cl.² B60C *23/06*
U.S. Cl. 340—58 **12 Claims**



1. An abnormal tire condition indicating system comprising:

transducer means including a piezoelectric crystal means for producing electrical energy in response to mechanical pressure exerted by the rotation of a tire resulting from an abnormal condition in said tire;

transmitter means powered by the energy produced for transmitting a radio frequency abnormal condition signal;

receiver means adapted to receive and recognize said abnormal condition signal for providing a warning of the condition;

charge storage means for storing the energy generated by the transducer means, said charge storage means including rectifier means for transforming the electrical energy of the transducer means into direct current pulses and capacitor means connected to the rectifier means for storing direct current pulses; and

release means for releasing the energy stored by the charge storage means to the transmitter means.

4,160,235

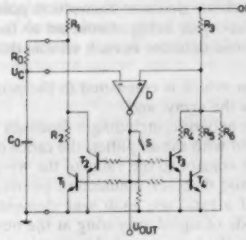
PULSE GENERATOR

Gerhard Krumrein, Neuenstadt, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 11, 1977, Ser. No. 841,312
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1976, 2647569
Int. Cl.² B60Q *1/46*; H03B *3/282*; H03K *1/08*
U.S. Cl. 340—81 R **5 Claims**

1. A pulse generator with a switchable output frequency and a selectable clock pulse ratio in the different output frequencies from a comparator, to the input of which is connected a voltage divider and a capacitor which is chargeable by the supply voltage, whereby an output signal dependent on the ratio of the input voltages arises at the output of the comparator, as well as having two transistors connected at the output of the

comparator, whereby the voltage ratio of the voltage divider is adjusted by one transistor so as to determine the frequency, while the other transistor forms a discharge current path for the capacitor, characterized in that at least two further transistors are connectible to the output of the comparator via a switch whereby the divider ratio of the voltage divider may be set by one transistor so as to change the frequency, while the other transistor path represents a further discharge current path for the capacitor.

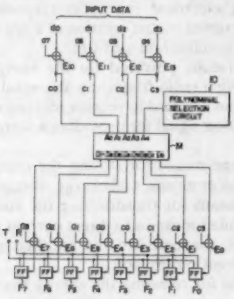


4,160,236

FEEDBACK SHIFT REGISTER

Takafumi Oka, Odawara, and Hiroshi Nakanishi, Sayama, both of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph and Telephone Public Corporation, both of, Japan

Filed Sep. 7, 1977, Ser. No. 831,140
Claims priority, application Japan, Sep. 10, 1976, 51-107755
Int. Cl.[2] G06F *11/12*
U.S. Cl. 340—146.1 AL **8 Claims**



4. A circuit for generating an error check and correction code for data transferred between devices comprising:

a register for storing an error check and correction code which consists of a plurality of bits;

address generating means responsive to said data and the contents of said register for generating addresses, said addresses being different from each other corresponding to the states of the data received and the contents of said register;

memory means responsive to said addresses for providing information stored in respective addressable locations representing the results of a predetermined logical operation on different selected data to obtain error check and correction codes; and

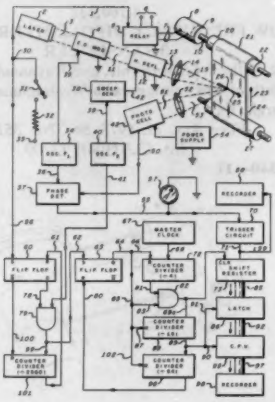
renewing means responsive to an output from said memory means for setting new error check and correction codes into said register.

4,160,237

OPTICAL READER FOR MULTILINE IMAGE PROCESSING

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 2, 1978, Ser. No. 874,450
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 F **20 Claims**



1. In optical pattern inspection apparatus:

source means for generating a light beam, first signal generator means,

modulator means responsive to said first signal generator means for cyclically shifting the polarization of said light beam between first and second polarization states,

focusing means responsive to said first and second polarization states for cyclically forming, at least at one point on said pattern, successive first and second spots of light of respective first and second different diameters,

light detector means for receiving light scattered by said pattern when illuminated by said first or second spots of light,

phase detector means responsive to said light detector means and to said first signal generator means for providing a variable polarity output representative of the difference in light scattered by said pattern from said first and second spots of light, and

utilization means for utilizing said variable polarity output.

4,160,238

REMOTE CONTROL ADDRESSING AND REPLY INDICATING SYSTEM

Albert Weckenmann, Ahrensburg; Jürgen Wesemeyer, Nüremberg; Georg Haubner, Berg; Werner Meier, Schwabach, and Hartmut Zöbl, Fürth, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,979
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644106
Int. Cl.[2] H04Q *11/04*
U.S. Cl. 340—147 R **36 Claims**

1. Remote control system for selection of at least one of a plurality of selectively switchable loads (122) from a central station (110) comprising

a bus system (106) connected to said central station and having a power bus (114), a clock bus (117), a load switching control bus (129), and a load reply bus (145);

said central station (110) including a clock source (112);

timing means (115, 281) defining a selection cycle and connecting said clock (112) to said clock bus (117) for a predetermined number of clock pulses;

load address means (**123**) to select connection of the selected load (**122.4**) to the power bus (**114**);

means (**115**) providing control signals synchronized with the clock pulses, coded in accordance with the load addressing means;

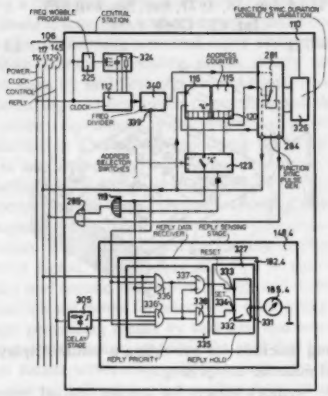
a load reply sensing stage (**148**) connected to the reply bus (**145**) to decode acknowledgment reply signals received from addressed loads;

and indicator means (**185, 352**) responsive to the output of the reply sensing stage;

at least some of said loads comprising

a load control receiver (**111**) having a decoding stage (**130, 131, 135**) connected to both said clock bus (**117**) and said control bus (**129**) to decode address command signals on the control bus appearing in synchronism with a clock pulse on the clock bus;

reply signal generator means (**149**) generating a signal indicative of response by the respective addressed load to the commanded switching function;



reply transmitting logic means (**146**) connected to the reply bus (**145**) and to the reply signal generator means (**149**) providing an operating function acknowledgment signal to said reply bus (**145**) substantially synchronously with the occurrence of said address command signal and hence the respective clock pulse on the clock bus (**117**),

wherein, in accordance with the invention,

at least one of the reply signal generator means (**149**) of one of said receivers (**111**) comprises a data generating stage (**341, 341', 174**);

and, in the central station, the reply decoding stage (**148**) comprises

a data receiving stage (**182**) connected to the reply bus (**145**) and the clock bus (**117**) and including a holding circuit (**327; 332; 357**),

and means (**335, 337; 335', 357, 336, 336'**) cyclically resetting the holding circuit in accordance with the duration or time passage of sequential selection cycles.

4,160,239

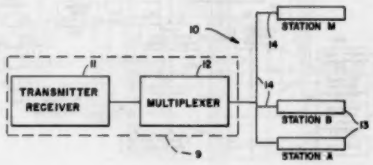
TRANSPONDER SYSTEM INCLUDING AN OSCILLATOR/RIPPLE COUNTER CONTROLLING A FIXED GRAY CODE LOGIC NETWORK IN CIRCUIT WITH A DECODER/DRIVER NETWORK FOR GENERATING "RED ALERT" END CONDITION DIGITAL SIGNALS IN A STORAGE TANK GAUGING SYSTEM

John S. Adamson, La Habra, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 25, 1977, Ser. No. 854,916

Int. Cl.[2] **H04Q** *9/00;* **G08B** *21/00*

U.S. Cl. 340—152 T **14 Claims**



1. Transponder network for generating a "red-alert" digital code upon (i) occurrence of an overflow condition within a storage tank under survey and (ii) receipt of a square wave interrogation signal from a transmitter/receiver of a tank gauging system located at a central station remote from said storage tank but electrically connected to said transponder network through an INTERROGATION, a MARK and a SPACE line of said tank gauging system, comprising:

(A) I/O network for receiving said interrogation signal including voltage divider means for generating a microcircuit drive voltage for a period concident with the pulse width of said interrogation signal;

(B) an oscillator/ripple counter formed essentially of MSI's connected to said I/O network and including at an input, a power-on-reset network for generating a reset pulse for said oscillator/ripple counter, said oscillator/ripple counter generating, in response to said reset pulse, sets of square wave pulses of differing repetition rates and pulse widths;

(C) a logic network means and multi-segment decoder/-driver means connected to each other and to (B) responding to selected sets of said square wave pulses to generate a synthetic digital code at microcircuit signal levels at an output means of said decoder/driver means;

(D) switching transistor means having one or more inputs connected to said decoder/driver means of (C), and one or more output means connected to said MARK and SPACE lines through said I/O of (A), switching transistor means being controllable as a function of said synthetic digital code to drive said MARK and SPACE lines between tank gauging operating potentials for generating said "red-alert" digital code of interest at said central station whereby said overflow condition within said storage tank can be indicated.

4,160,240

BINARY DIGITAL PAGER HAVING AN EIGHT FUNCTION CODE READ-OUT

Phillip Partipilo, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 13, 1978, Ser. No. 869,394

Int. Cl.[2] **G06F** *7/02;* **H04L** *1/10;* **H04M** *11/02;* **H04Q** *3/02*

U.S. Cl. 340—311 **18 Claims**

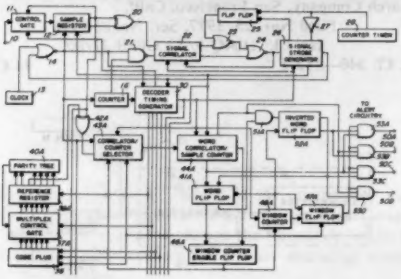
1. In a communications device for responding to a predetermined two-word binary address code within a stream of received data bits, logic circuitry for providing multiple function code displays comprising in combination;

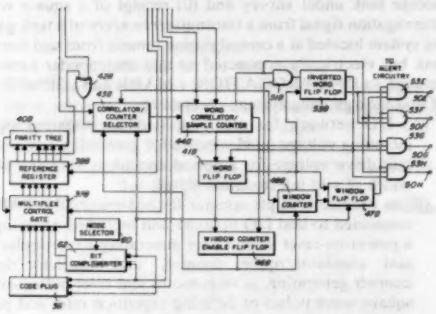
first register means for sampling and temporarily retaining the received data bits;

storage means for permanently retaining binary address code data;

first circuit means coupled to the storage means for receiving the address code data and deriving therefrom the predetermined two-word address code;

second circuit means coupled to the storage means for receiving the address code data and deriving therefrom an address code related to the predetermined address code;





first comparator means for comparing the received data bits and the bits of the predetermined address code and for providing a first output signal indicative of substantial agreement therebetween;

second comparator means for comparing the received data bits and the bits of the address code related to the predetermined address code and for providing a second output signal indicative of substantial agreement therebetween;

indicator means for providing different indications in response to the first and second output signals.

4,160,241

ELECTROCHROMIC DISPLAY DEVICE

Shotaro Shimizu, Kunitachi, and Toyoharu Fujikawa, Iruma, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1977, Ser. No. 788,823

Claims priority, application Japan, Apr. 20, 1976, 51-45172; Oct. 9, 1976, 51-107917

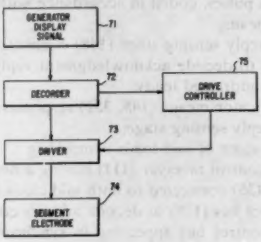
Int. Cl.[2] G09F *9/32*

U.S. Cl. 340—763 **8 Claims**

1. Electrochromic display device utilizing electrochromic material capable of producing reversible coloration by means of an electrochemical oxidation-reduction and memory action, said display comprising:

display electrodes made up of a plurality of segment electrodes, said segment electrodes being selectively driven to display various patterns; and

a means for suitably controlling the driving conditions in proportion to the area of said segment electrodes such that



each of said segment electrodes is driven to produce a uniform color density at all times.

4,160,242

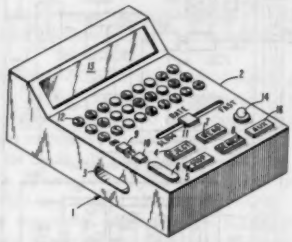
READING MACHINE

Gerald C. Fowler, 2305 Fairview Rd., Gadsden, Ala. 35901, and Terence D. Hughey, 2405 Pine Forrest Dr., Norcross, Ga. 30093

Filed Jun. 28, 1977, Ser. No. 810,825

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—711 **13 Claims**



1. A reading machine for providing a visual display of selected textual material comprising:

addressable memory means for storing textual material in digital form, said memory means comprising a read only memory including output means for providing digital output signals of textual material at selected addresses in said memory means;

addressing means for applying selected address signals to said memory means to cause said memory means to apply textual material at the corresponding selected addresses to said output means;

text selection means for indicating textual material to be displayed;

comparison means coupled to said output means, to said text selection means, and to said addressing means for inhibiting application of selected address signals from said addressing means to said memory means when the textual material at said output means corresponds with the textual material indicated by said text selection means;

a second memory device, coupling means connected to said read only memory, to said second memory device and to said comparison means and capable of assuming a first state in which said read only memory is coupled to said comparison means and a second state in which said second memory device is coupled to said comparison means;

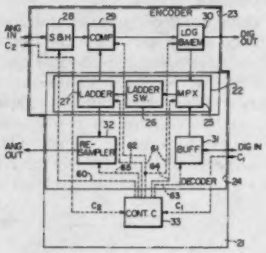
control means for causing said coupling means alternatively to assume its first state or to assume its second state; and

display means coupled to said output means for forming a visual display of textual material applied from said output means to said display means.

4,160,243
ASYNCHRONOUS REVERSIBLE ANALOG TO DIGITAL CONVERTER

Takao Moriya, Yokohama; Masao Yamasawa, and Hirohisa Gambe, both of Tokyo, all of Japan, assignors to Fujitsu Limited, Japan

Continuation-in-part of Ser. No. 727,341, Sep. 28, 1976, abandoned. This application Jul. 18, 1978, Ser. No. 925,787
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 C **10 Claims**



1. An asynchronous signal processing circuit device comprising a first signal processing circuit means for performing a first mode conversion and a second signal processing circuit means for performing a second mode conversion, said device including voltage generating means jointly used on a time-shared basis by said first and second signal processing circuit means during said first mode conversion and during said second mode conversion, respectively, for generating voltage signals having a value corresponding to digital values generated in said first and second signal processing circuit means, respectively; and device also including a control clock source for controlling the respective operations of said first and second signal processing circuit means and responsive, during the operation of said first signal processing circuit means, to an interrupt signal, for stopping said first mode conversion and starting said second mode conversion; said device also including multiplexer means for selectively controlling the use of said voltage generating means by said first and second signal processing circuit means, respectively, said first signal processing circuit means performing said first mode conversion during a time interval defined as one sampling time period, said control clock source including means for defining a marginal time slot within said one sampling time period, and means for compensating, during said marginal time slot, for asynchronism between said first mode conversion and said second mode conversion during change-overs from said first mode conversion to said second mode conversion.

4,160,244
CONVERSION CIRCUIT

James E. Solomon, Saratoga, and James B. Cecil, Santa Clara, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 25, 1976, Ser. No. 661,124
Int. Cl.[2] H03K *13/03*
U.S. Cl. 340—347 DA **2 Claims**

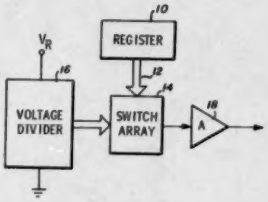
1. A circuit for converting a digital word having n bits into an analog voltage having N different values, each value representing a different combination of bits in said word whereby said word can represent the numbers from 0 to $N-1$ and $N=2^n$, said circuit having first and second terminals and comprising:

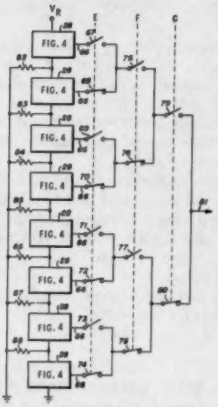
means for coupling a reference voltage between said first and second terminals in said circuit to provide a reference current therein;

means for coupling a plurality of M resistor voltage dividers in series between said first and second terminals to divide said reference voltage into M increments associated with the m^{th} bit within said digital word and $M=2^m$;

each of said voltage dividers comprising a plurality of series connected resistors which further divide each of said M increments into smaller increments wherein said plurality of voltage dividers in combination produce N increments of said reference voltage;

a plurality of switching devices forming an array coupled between said voltage dividers and an output terminal to provide N different paths to said output terminal whereby any one of said N increments of said reference voltage can be applied to said output terminal as a function of the bit





content of said digital word, said array of switching devices being arranged in a first group coupled to said voltage dividers and actuatable by the least significant bits in said digital word up to said m^{th} bit, and a second group coupled between said first group and said output terminal and actuatable by the most significant bits of said word including said m^{th} bit; and

shunt resistor means coupled between the junctures of said voltage dividers and one of said first and second terminals to create an R-2R ladder network for making said M increments to have different voltage values whereby said analog voltage has an A-Law relationship to said numbers represented by said digital word.

4,160,245
APPARATUS FOR CONVERTING DIGITAL ANGULAR DATA INTO ANALOG SINE AND COSINE COMPONENTS

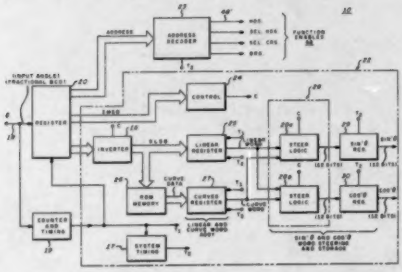
Charles H. Scott, Phoenix, Ark., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,894
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 SY **7 Claims**

1. Apparatus for converting an $(n+3)$ bit digital signal representative of input angular data into output pseudo signals

representative of the sine and cosine components of the digital input angular data wherein the pseudo sine and pseudo cosine components are represented by a linear portion for one of the components and a curved portion for the other component in predetermined angular octants identified by the 3 MSB of said digital signal and wherein in each of said octants the ratio of the pseudo sine to the pseudo cosine components is equal to the true tangent of the input angular data comprising:

first means responsive to n bits of the digital signal for linearly decoding said (n) bits to provide a first digital signal representative of a value of the linear portion of one of said pseudo sine and pseudo cosine components of said input angular data,



second means including addressable memory means responsive to said (n) bits of the digital signal for providing a second digital signal corresponding to a value of the curved portion of said other component which when algebraically combined with said first digital signal represents the other of said pseudo sine and pseudo cosine components, and

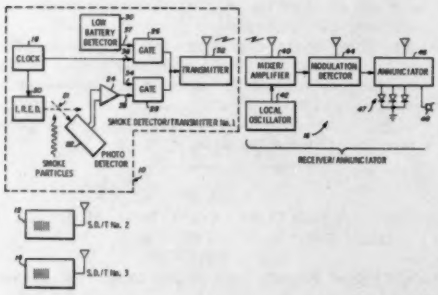
third means responsive to the three most significant bits of said digital signal and said first and second digital signals for identifying said angular octant and algebraically combining appropriate ones of said pseudo sine and pseudo cosine components such that the ratio of said pseudo sine to said pseudo cosine component is equal to the true tangent of said digital input angular data in said octants with an (n+3) bit resolution.

4,160,246

WIRELESS MULTI-HEAD SMOKE DETECTOR SYSTEM

Stephen M. Martin, Pleasanton, and Ralph P. Miller, Sunnyvale, both of Calif., assignors to Fairchild Camera and Instrument Corp., Mountain View, Calif.

Filed Oct. 3, 1977, Ser. No. 839,074
Int. Cl.[2] G08B *17/10*
U.S. Cl. 340—630 **9 Claims**



1. A detector/transmitter unit for a wireless smoke detector system comprising at least one detector/transmitter unit and a receiver/annunciator unit for producing alarm signals in response to actuating signals transmitted by radio frequency waves from said at least one detector/transmitter unit, said detector/transmitter unit comprising:

pulse means for repetitively generating a clock signal;

an infrared source for repetitively generating a beam of infrared radiation responsive to said clock signal and substantially coincident in time with said clock signal;

a photodetector having a collection axis angularly intersecting said beam for detecting infrared radiation reflected from smoke particles encountered by said beam and for developing an infrared detection signal whenever smoke particles are detected;

low battery voltage detecting means for monitoring the voltage across a power source for the detector/transmitter unit and for developing a low battery signal whenever said voltage falls below a predetermined level; and

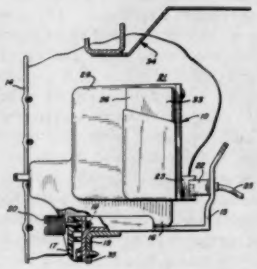
transmitter means (1) for generating a first actuating signal for said receiver/annunciator unit in response to both said clock signal and said low battery signal, and (2) for generating a second actuating signal for said receiver/annunciator in response to both said clock signal and said detection signal.

4,160,247

MEANS FOR HOUSING AN ELECTRICAL CONTROL

James P. Laughlin, Jr., Evansville, Ind.; Mark C. Loessel, St. Joseph, Mich., and Robert H. O. Kraemer, Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 3, 1977, Ser. No. 765,498
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—693 **16 Claims**



1. In an electrical apparatus having structural means defining a partially enclosed control space, the improvement comprising:

electrical control means provided with a control circuit and a replaceable component;

housing means housing said control means; and

means for removably mounting the housed control means in said control space, said structural means being arranged to preclude access to said control circuit in said housing means when said housed control means is in said control space, said replaceable component precluding access to a portion of said control circuit when said component is associated with said control circuit.

4,160,248

SOLID STATE PULSED COHERENT DOPPLER RADAR

Theodore Hubka, Pleasantville, and Robert W. Slater, Bardonia, both of N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 25, 1977, Ser. No. 854,570
Int. Cl.[2] G01S *9/44*
U.S. Cl. 343—8 **4 Claims**

1. A Doppler radar comprising:

a transmitter,

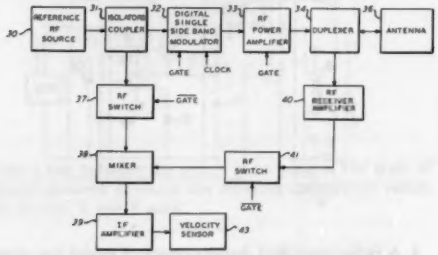
a receiver,

a common antenna connected to said transmitter and said receiver for transmission and reception of radar signals,

a source of rf signals having a constant frequency,

means in said receiver for obtaining an IF frequency by sampling a portion of said rf signals for use as a local oscillator and combining said local oscillator signals with return signals in a mixer,

means in said transmitter for translating the frequency of said rf signals to a frequency representing the addition of said IF frequency with the frequency of said rf signals during transmit time and reverting back to the frequency of said rf signals during receive time, and



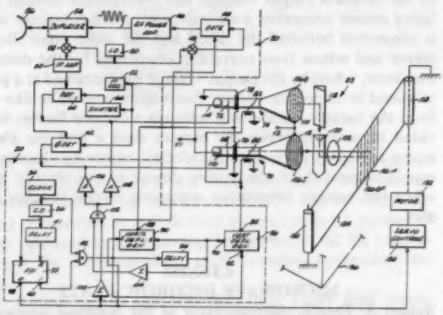
means for simultaneously gating on said rf signals during transmit time and gating off said rf signals during receive time whereby leakage amplitude modulation signals are not demodulated into said receiver wherein said frequency translating means comprises a digital binary counter for translating said rf signals whereby leakage amplitude modulation sideband signals are not demodulated into the mixer of said receiver and said leakage signals lie outside the centered passband Doppler frequency.

4,160,249

ANALOGUE STORAGE AND PROCESSING SYSTEM

Joseph R. Kotlarski, Palos Verdes, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 8, 1967, Ser. No. 638,696
Int. Cl.[2] G01S 9/44
U.S. Cl. 343—9 PS **13 Claims**



1. A system for the storage, retrieval and processing of a plurality of signals comprising:

a signal source for providing a plurality of simultaneously occurring first data signals;

means, including a storage surface, coupled to said signal source for recording the plurality of first data signals on said storage surface in a spatially interleaved pattern along a first dimension of said storage surface; and

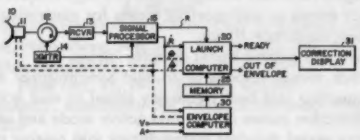
readout means for scanning said storage surface along a dimension transverse to the first dimension.

4,160,250

ACTIVE RADAR MISSILE LAUNCH ENVELOPE COMPUTATION SYSTEM

Walker Butler, and Randolph G. Moore, Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 734,585, Oct. 21, 1976, abandoned. This application Oct. 21, 1977, Ser. No. 844,254
Int. Cl.[2] G01S 9/04
U.S. Cl. 343—9 R **6 Claims**



1. An active radar missile launch envelope computation system adapted to be mounted on a missile for control thereof comprising:

(a) a radar including a transmitter and a receiver for providing output signals indicative of the range to a target and the rate of change of the range;

(b) angle determining means incorporated in said radar for providing output signals indicative of the angular position and angular rate of the target relative to a predetermined axis fixed in relation to the missile and the rate of change of the angular position;

(c) computation means connected to receive the output signals from said radar and said angle determining means;

(d) memory means connected to said computation means and including storage means for signals indicative of maximum and minimum capabilities of the missile; and

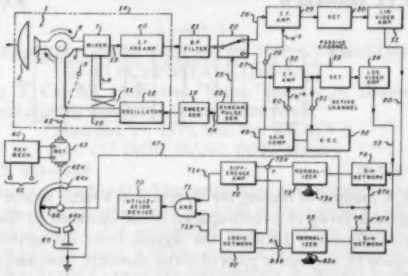
(e) said computation means comparing received output signals to the maximum and minimum capabilities signals stored in said memory means and providing a ready output signal when the comparison lies within the stored capabilities.

4,160,251

HYBRID DUAL MODE RADIOMETRIC SYSTEM

Robert E. Lazarchik, Largo, and Robert S. Roeder, Dunedin, both of Fla., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,752
Int. Cl.[2] G01N 1/00
U.S. Cl. 343—100 ME **11 Claims**



1. A high frequency radiometric system having azimuth scanning directive antenna means and receiver means and characterized by cyclic operation in an active mode wherein transmitted high frequency energy is radiated and received and a passive mode wherein radiometric noise signals are received, said high frequency radiometric system comprising:

synchronizer means,

voltage controlled high frequency generator means for producing a cyclic signal having successive swept and con-

stant carrier frequency portions in response to said synchronizer means during said respective active and passive modes,

isolator means for coupling a first portion of said cyclic signal from said voltage controlled high frequency oscillator means for illumination of a target by said directive antenna means in a terrain radiating radiometric noise signals,

coupler means for coupling a second portion of said cyclic signal from said voltage controlled high frequency oscillator means to said receiver means for generating therein a beat frequency signal,

active and passive signal detector means,

switch means responsive to said synchronizer means for coupling said beat frequency signal to said active signal detection means during said active mode and to said passive signal detector means during said passive mode,

computer means responsive to said active and passive detector means for yielding a response substantially only in the presence of said target while suppressing effects of said radiometric signals,

said computer means including at least:

first sample-and-hold means responsive to said passive detector means,

second sample-and-hold means responsive to said active detector means,

sampling control means cyclically actuated by said azimuth scanning directive antenna means for sampling the contents of said first and second sample-and-hold means for yielding processed passive and active signals, and

respective normalizer means for normalizing said processed passive and active signals,

utilization means responsive to said normalizer means in the presence of said response.

4,160,252

METHOD OF DETERMINING THE DIRECTION OF A RADIO SOURCE AND RADIO INTERFEROMETER SYSTEM

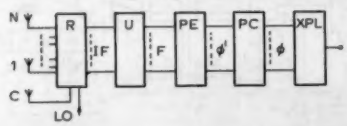
David A. Lucas, Crawley Down, and Richard P. Vincent, Crawley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 22, 1978, Ser. No. 888,839

Claims priority, application United Kingdom, Mar. 25, 1977, 12628/77

Int. Cl.[2] G01S *3/48*

U.S. Cl. 343—113 R **5 Claims**



1. A method of finding the direction of a radio source using a circular array of evenly-spaced aerial elements to find the phase differences between the signals from the source and received by successive pairs of aerial elements, from said phase differences a position on the circle being determined indicative of the direction of the radio source, characterized in that in digital form a plurality of phase differences are measured, the magnitude of the phase differences occurring for successive pairs of aerial elements having a sinusoidal variation, in that each digitally-expressed phase difference is examined to determine at least one point where the sinusoid crosses the zero axis and in that from this zero crossing point a position on the circle is derived indicative of the angle of incidence of the rays from the source relative to a reference direction.

4,160,253

RADIO CONTROLLED, BATTERY-OPERATED MODEL TOY

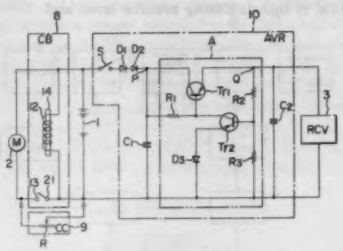
Kenichi Mabuchi; Yoshihisa Tsuchimochi, and Koziro Komatsu, all of Tokyo, Japan, assignors to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed Aug. 25, 1976, Ser. No. 717,486

Claims priority, application Japan, Aug. 28, 1975, 50-104302

Int. Cl.[2] H04B *7/00*

U.S. Cl. 343—225 **4 Claims**



1. A radio controlled, battery-operated model toy, comprising a radio controlled receiver, an electric motor, a battery device for supplying energy to the motor through an electric supply circuit, a servo-mechanism coupled to and operated by the output from the radio controlled receiver, a voltage responsive automatic circuit breaker connected between the battery device and the electric motor which opens the electric supply circuit of the electric motor in response to a voltage drop of the battery device and maintains the circuit in an open state, and a voltage regulator/noise filter connected between the battery device and the radio controlled receiver, the voltage regulator/noise filter comprising a filter circuit consisting of at least one diode and a capacitor, said diode series-connected between the battery device and the capacitor, and a voltage regulating circuit connected in parallel with the capacitor, and wherein said at least one diode is connected in the forward direction between the positive terminal of the battery device and the capacitor to prevent discharge of the capacitor upon a voltage drop of the battery, and further comprising a detecting transistor which detects the output voltage of the voltage regulating circuit and whose base current is controlled by the detected output voltage, and wherein the voltage regulating circuit comprises a current controlling transistor which is connected between the diode and the radio controlled receiver and whose base current is controlled by the detecting transistor, whereby the output voltage is maintained at a predetermined level despite voltage fluctuations and pulse-like noise from the battery device, and wherein a current limiter is provided in series between the battery device and the electric motor to supply current to the electric motor by shunting the supply current from the battery device to the electric motor when the voltage responsive automatic circuit breaker operates.

4,160,254

MICROWAVE DICHROIC PLATE

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Thomas E. Wise, Derwood, Md.

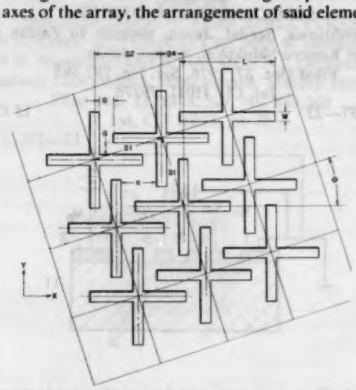
Filed Feb. 16, 1978, Ser. No. 878,542

Int. Cl.[2] H01Q *15/00*

U.S. Cl. 343—909 **7 Claims**

1. A dichroic plate for reflecting microwave energy within a certain frequency band and for passing microwave energy within another frequency band, said plate having an array of interlaced elements, each of said elements having first and second orthogonal arms of approximately the same length which are crossed at a point at the middle thereof, said arms

being arranged with their center lines aligned parallel to the X and Y axes of the array, the arrangement of said elements being



such that a line between the points of crossing of the arms of the closest adjacent elements has differing component values relative to said X and Y axes.

4,160,255

RECORDING APPARATUS WITH INTERMITTENT POWER USAGE

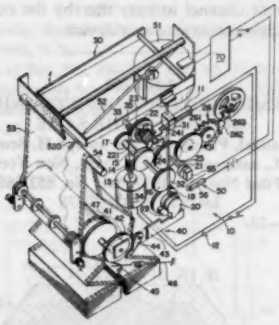
Keigo Kobayashi, Ibaraki, Japan, assignor to Mitogiken, Ltd., Japan

Filed Sep. 19, 1977, Ser. No. 834,497

Claims priority, application Japan, Oct. 4, 1976, 51-119699; Oct. 4, 1976, 51-134160[U]; Oct. 13, 1976, 51-138298[U]

Int. Cl.² G01D *15/04*

U.S. Cl. 346—79 **14 Claims**



1. In dot type recording apparatus which has a power source, and dotting means and recording paper feed means, both being operated by said power source, and in which recording is executed by said dotting means causing a pointer of a meter operated by a measuring instrument to hit the recording paper, the improvement in such recording apparatus comprising:

said dotting means and said recording paper feed means having, a motor driving at least two cams and being driven by said power source, and a clock mechanism operated by rotation of said motor;

an electrical switch in circuit between said power source and said instrument and having "on" and "off" periods of time determined by said clock mechanism;

said dotting means pressing the pointer of the meter against the recording paper for a fixed dotting period of time by means of one of said cams rotated by said motor;

said paper feed means intermittently feeding recording paper a fixed length in a short fixed feeding period of time other than the dotting period of time of said dotting means by means of another of said cams being rotated by said motor; and

means for operating said instrument and said meter only during a fixed period of time greater than and including said dotting period of time as determined by said "on" and "off" periods of time of said switch, in interlocking relationship with said dotting means, and thus operating said measuring instrument intermittently.

4,160,256

TUBULAR PEN FOR RECORDING APPARATUS

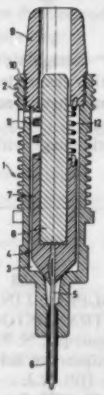
Peter Dziuk, Nuremberg, Fed. Rep. of Germany, assignor to J. S. Staedtler, Nuremberg, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,565

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1976, 2648319

Int. Cl.² G01D *15/16*

U.S. Cl. 346—140 A **9 Claims**



1. A tubular pen for recording apparatus and the like comprising a hollow body having an end cap, a freely displaceable weight within said body, said weight comprising a casing of synthetic resin material and a metallic core in said casing, and means firmly attached to each of said cap and weight for undetachably connecting said cap and weight such that there is a relative movement therebetween and the connected cap and weight define a single assembly.

4,160,257

THREE ELECTRODE SYSTEM IN THE GENERATION OF ELECTROSTATIC IMAGES

Jeffrey J. Carrish, Hopkinton, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Jul. 17, 1978, Ser. No. 925,667

Int. Cl.² G03G *15/044;* H01J *61/06*

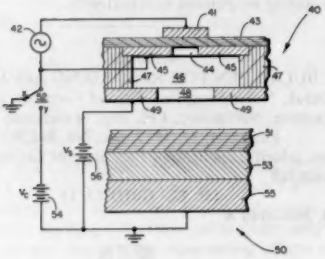
U.S. Cl. 346—159 **16 Claims**

1. An improved method for generating electrostatic images by means of an ion generating assembly of the type in which an alternating potential is applied between a "driver" electrode substantially in contact with one side of a solid dielectric member and a "control" electrode substantially in contact with an opposite side of the solid dielectric member, said control electrode having an edge surface disposed opposite said driver electrode to define an air region at the junction of the edge surface and the solid dielectric member, to induce ion producing electrical discharges in the air region between the solid dielectric member and the edge surface of the control electrode, and ions are extracted by an extraction potential V_C between the control electrode and a further electrode member and these ions

applied to a dielectric surface, in which the improvement comprises the steps of

controlling the extraction of ions by

providing an apertured "screen" electrode which is separated from the control electrode by an apertured solid dielectric member and which lies between the control electrode and the dielectric surface, and



applying a "screen" voltage V_S between the screen electrode and the further electrode member, wherein V_S has a magnitude greater than or equal to zero and the same polarity as V_C; and

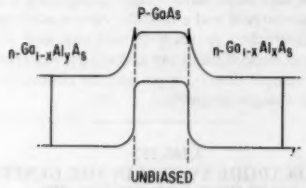
forming an electrostatic image with the extracted ions.

4,160,258

OPTICALLY COUPLED LINEAR BILATERAL TRANSISTOR

Larry R. Dawson, Albuquerque, N. Mex., and Stephen Knight, Murray Hill, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 18, 1977, Ser. No. 852,728
Int. Cl.[2] H01L *29/161*
U.S. Cl. 357—16 **15 Claims**



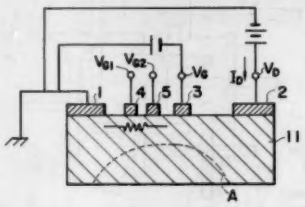
1. A heterojunction phototransistor comprising a first epitaxial layer, said first layer having a first bandgap, a first carrier concentration, and a first conductivity type; a second epitaxial layer, said second layer being disposed on said first layer and having a second bandgap, a second carrier concentration, and a second conductivity type, said second bandgap being smaller than said first bandgap; a third epitaxial layer, said third layer being disposed on said second layer and having a third bandgap, a third carrier concentration, and said first conductivity type, said third bandgap being greater than said second bandgap; said first, second and third epitaxial layers each consisting essentially of semiconducting material, at least two electrical contacts, at least one of said contacts contacting said first layer and at least one of said contacts contacting said third layer characterized in that said first carrier concentration and said third carrier concentration are less than said second carrier concentration.

4,160,259

SEMICONDUCTOR DEVICE

Jun-ichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Filed Dec. 27, 1976, Ser. No. 757,583
Int. Cl.[2] H01L *29/76*
U.S. Cl. 357—22 **15 Claims**



1. A field effect semiconductor device of variable characteristics, comprising:

a high resistivity semiconductor region of one conductivity type including a current channel, the high resistivity semiconductor region having predetermined impurity concentration and dimensions;

said predetermined impurity concentration and dimensions being chosen such that the semiconductor device selectively exhibits non-saturating current versus voltage characteristics at least in a portion of the operative range of the semiconductor device;

a pair of current electrode structures formed on the two ends of said current channel and forming ohmic contacts therewith; and

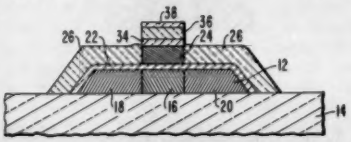
at least two control electrode means formed adjacent to the current channel for controlling the resistivity of the effective current channel to vary thereby the current versus voltage characteristic of said device.

4,160,260

PLANAR SEMICONDUCTOR DEVICES AND METHOD OF MAKING THE SAME

Charles E. Weitzel, Plainsboro, and Joseph H. Scott, Princeton, both of N.J., assignors to RCA Corp., New York, N.Y.

Filed Nov. 17, 1977, Ser. No. 852,565
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 **3 Claims**



1. A semiconductor device comprising:

a body of semiconductor material having a planar surface thereon and spaced drain and source portions embedded therein at the surface, the drain and source portions spaced one from the other defining a channel portion therebetween;

a region of polycrystalline silicon disposed over the channel portion of the semiconductor body; and

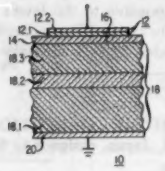
a layer of oxidized polycrystalline silicon disposed over the drain and source portions of the semiconductor body, the oxidized polycrystalline silicon layer extending up to and contacting the polycrystalline silicon region, with the surface of the oxidized polycrystalline silicon layer being substantially coplanar with the surface of the polycrystalline silicon region.

4,160,261

MIS HETEROJUNCTION STRUCTURES

Horace C. Casey, Jr.; Alfred Y. Cho, both of Summit, and Edward H. Nicollian, Murray Hill, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 13, 1978, Ser. No. 869,369
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 **9 Claims**



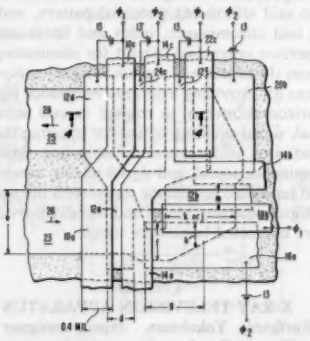
1. A semiconductor device comprising
a single-crystal semiconductor body,
an insulative layer formed on a major surface of said body, and
a metal electrode formed on said insulative layer CHARACTERIZED IN THAT
said insulative layer comprises a single-crystal layer having a resistivity in excess of about 10^8 ohm-cm and adapted to prevent any substantial flow of current therethrough, said insulative layer having a wider bandgap than, but substantially the same lattice constant as, said body so as to form a substantially lattice-matched heterojunction at the interface between said body and said insulative layer.

4,160,262

CCD ELECTRODE AND CHANNEL STRUCTURE FOR 180° TURN

Michael G. Kovac, Sudbury, Mass., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 786,402, Apr. 11, 1977, abandoned. This application Sep. 18, 1978, Ser. No. 943,146
Int. Cl.[2] H01L *29/78; G11C 19/28*
U.S. Cl. 357—24 **8 Claims**



1. In a charge-coupled device (CCD) which includes a semiconductor substrate, a channel in the substrate for the propagation of charge in said substrate, said channel making a turn of approximately 180°, the edges of said channel being defined by potential barriers in the substrate for confining any charge which may be present in the channel to the channel, the channel comprising an input first channel region having an output end, a second channel region, receptive of charge from the output end of said first channel region, said second channel region having an input end and an output end, and a third channel region receptive of charge from the second channel region, said third channel region having an input end, said first, second and third channel regions each having a length dimension in the direction of charge propagation along that channel region, and a width dimension at right angles to its length dimension and which extends between the edges defined by said potential barriers of said channel region, the length dimension of the second channel region being at an angle of approximately 90° to the length dimension of the first channel region, and the length dimension of the third channel region being at approximately 90° to the length dimension of the second channel region, said CCD including also electrode means insulated from the substrate over said channel and receptive of potentials for forming potential wells in the channel for the storage of charge and for the propagation of charge from the first to the second to the third channel regions, each electrode means having a length dimension in the direction of charge transfer along the channel region it is over and an effective width dimension at right angles to the length dimension equal to the width of the channel region the electrode is over, the improvement in said structure comprising:

a first one of said electrode means over the first channel region;

a second one of said electrode means over the output end of the first channel region and the input end of the second channel region;

a third one of said electrode means over the output end of the second channel region and the input end of the third channel region;

said first electrode means having a given effective length over said first channel region in the direction of the length dimension of said first channel region which is sufficiently small that during the transfer of charge from a substrate region beneath said first electrode means, charge propagation at a desired propagation speed will take place;

said second electrode means having an effective first length in the direction of the length dimension of said first channel region which is substantially greater than said given length and an effective second length in a second direction at approximately 90° to said length dimension of said first channel region, that is, in the direction of the length dimension of said second channel region, which is not substantially greater than said given effective length;

said third electrode means having an effective first length in the direction of the length dimension of said second channel region which is substantially greater than said given length and an effective second length in the direction of the length dimension of said third channel region which is not substantially greater than said given effective length;

first means including said first and said second electrode means responsive to applied potentials for propagating charge in the direction of the length dimension of said first channel region from a substrate region beneath said first electrode means to a substrate region beneath said second electrode means;

second means including said second and said third electrode means responsive to applied potentials for propagating charge in the direction of the length dimension of said second channel region from said substrate region beneath said second electrode means to a substrate region beneath said third electrode means; and

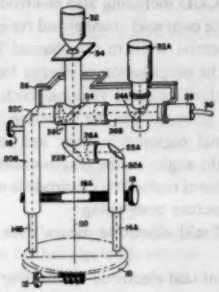
third means including said electrode means, responsive to applied potentials, for propagating charge in the direction of the length dimensioned of said third channel region from said substrate region beneath said third electrode means into said third channel region.

4,160,263

DUAL OR MULTIPLE OBJECTIVE VIDEO MICROSCOPE FOR SUPERIMPOSING SPACED IMAGES

Harold Christy, Phoenix, and Robert R. Bernham, Apache Junction, both of Ariz., assignors to George R. Cogar, Frankfort, N.Y.

Filed May 15, 1978, Ser. No. 905,576
Int. Cl.[2] H04N 9/02
U.S. Cl. 358—1 **30 Claims**



1. An optical vidicon apparatus comprising, in combination, multiple objective lenses, a vidicon optically coupled to said multiple objective lenses, display means coupled to said vidicon to display images received by said vidicon, means for moving at least one of said multiple objective lenses toward and away from at least another of said multiple objective lenses, and means for maintaining the length of the optical path between said one of said multiple objective lenses and said vidicon substantially equal to the length of the optical path between said other multiple objective lenses and said vidicon.

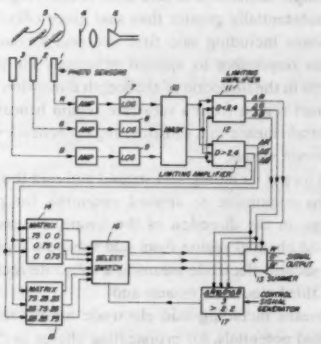
19. An optical vidicon apparatus in accordance with claim **1** wherein said vidicon having means for permitting images viewed by said vidicon received from said multiple objective lenses to be viewed in color.

4,160,264

MATRIX COMPENSATOR FOR COLOR VIDEO SIGNALS

Keith R. Hailey, Watford, and Michael Quinton, Abbots Langley, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,931
Int. Cl.[2] H04N 9/52, 9/535
U.S. Cl. 358—29 **15 Claims**



1. For use with a device for scanning a image, point-by-point, and in response thereto for producing a set of color video signals, the level of any given signal thereof representing the density or brightness of the respective color of the image at the point being scanned, a matrix compensator for modifying the color video signals, comprising:

(a) matrix means, capable of providing at least first and second matrixing effects, for receiving the color video signals and for modifying these signals, said auxiliary matrix means being effective when providing said first matrixing effect to shift said color video signals toward a representation of neutral density; and

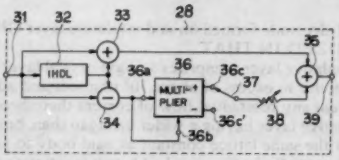
(b) switch means responsive to the levels of the color signal(s) for selectively controlling, point-by-point, the matrixing effect provided by said auxiliary matrix means.

4,160,265

VERTICAL APERTURE CORRECTION CIRCUIT

Sadaaki Tanaka, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 18, 1978, Ser. No. 897,426
Claims priority, application Japan, Apr. 25, 1977, 52-46784
Int. Cl.[2] H04N 5/14
U.S. Cl. 358—37 **16 Claims**



11. In a color image pickup device having an image pickup tube including a photo-electric conversion layer, means for forming on said layer a color-separated image of an object being televised, means for applying an alternating potential pattern to said layer, means for deriving from said photo-electric conversion layer a composite signal which includes a chrominance signal, an index signal due to said alternating potential pattern and having a frequency equal to the carrier frequency of said chrominance signal and a luminance signal which undergoes level changes in successive horizontal intervals due to said alternating potential pattern, and means for separating said chrominance, index and luminance signals; a vertical aperture correction circuit for eliminating said level changes from the separated luminance signal comprising delay circuit means for providing a delayed luminance signal delayed by one horizontal interval in respect to said separated luminance signal, signal squaring means for squaring the difference in level between said separated luminance signal and said delayed luminance signal, and signal mixing means for mixing at least said separated luminance signal with the squared signal from said signal squaring means and thereby providing a vertical aperture corrected luminance signal.

4,160,266

X-RAY TELEVISION APPARATUS

Tetsuro Kurihara, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 1, 1978, Ser. No. 901,795
Claims priority, application Japan, May 4, 1977, 52-51516
Int. Cl.[2] H04N 5/32
U.S. Cl. 358—111 **6 Claims**

1. An X-ray television apparatus comprising:

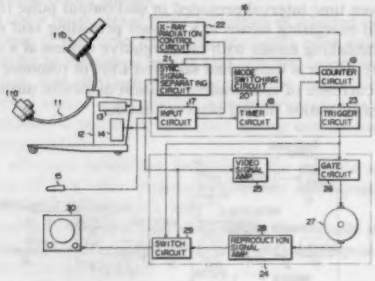
means for radiating X-rays to an object to be examined;

means for transducing the X-ray image of said object to a television signal;

switching means for enabling said radiating means to operate;

first timer means for producing a signal in accordance with the operation of said switching means;

second timer means for producing a signal at the end of the operation of said switching means;
means for selecting one of said first and second timer means;
means for separating a synchronizing signal from said television signal;
means for producing a first signal in response to the signal from the selected one of said first and second timer means and said synchronizing signal and a second signal after a lapse of a predetermined time interval of said first signal;



means for energizing said X-ray radiating means in response to the operation of said switching means and deenergizing the same in response to said second signal;
means for recording a desired part of said television signal in response to said first signal; and means for displaying selectively said television signal and said desired part of said television signal which are provided through said transducing means and recording means, respectively.

4,160,267

SWITCHING METHOD FOR MEASURING TWO NEIGHBORING FLYING TARGETS OR OBJECTS IN SUCCESSION

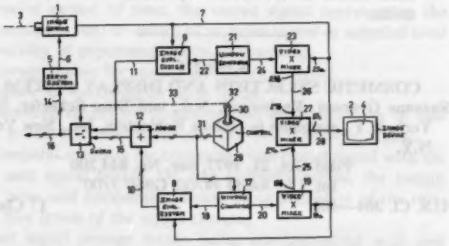
Walter Eicher, Gockhausen, Switzerland, assignor to Contraves AG, Zürich, Switzerland

Filed May 8, 1978, Ser. No. 903,668

Claims priority, application Switzerland, May 26, 1977, 6487/77

Int. Cl.[2] **H04M** *7/18*

U.S. Cl. 358—126 **6 Claims**



1. A switching method for measuring two neighboring flying targets in succession by means of a measuring installation, comprising the steps of:
providing a measuring installation having an electronic observation system with image sensor and image device, a regulation system for automatically aligning the image sensor at a flying target to be measured and containing at least one first image evaluation system where there are formed from signals of the observation system a first pair of first deviation signals, one of the deviation signals constituting a measure of the momentary angular deviation in azimuth and the other deviation signal constituting a measure of the momentary angular deviation in elevation between the direction of a first flying target and the line of sight of the image sensor and delivered to the regulation system as an actual value;
generating at the observation system an electronic window;
framing the trace of the line of sight by means of the electronic window at the image device;
limiting the processing of the signals of the observation system in the image evaluation system to such signals which correspond to an image point located at the image device within the electronic window;
forming in the observation system during the automatic aligning of the image sensor at the first flying target by means of the first image evaluation system a second electronic window;
positioning the second electronic window at the image device by means of a manually actuatable control means as a frame about the image of a second flying target;
producing in a second image evaluation system a second pair of second deviation signals;
said second pair of second deviation signals comprising such signals of the observation system which correspond to an image point located at the image device within the second electronic window;
one of the second signals constituting a measure for the momentary angular deviation in azimuth and the other of said signals a measure of the momentary angular deviation in elevation between the direction of the second flying target and said line of sight; and
after positioning the second electronic window at the image of the second flying target switching the actual value of the regulation system from the first pair of deviation signals to the second pair of deviation signals.

4,160,268

SIGNAL PICKUP DEVICE WITH TRACKING CONTROL AND JITTER COMPENSATION FOR A VIDEO DISC

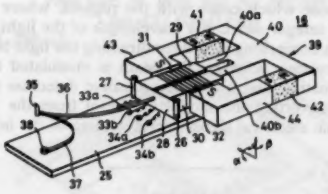
Kunio Goto, Yokohama; Osamu Tajima, Ayase, and Hideaki Miyatake, Yamato, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 29, 1978, Ser. No. 891,492

Claims priority, application Japan, Mar. 31, 1977, 52-35502; Apr. 11, 1977, 52-41151; Sep. 29, 1977, 52-130924[U]; Oct. 7, 1977, 52-119999; Oct. 12, 1977, 52-122230

Int. Cl.[2] **G11B** *3/38, 21/10*

U.S. Cl. 358—128 **10 Claims**



1. A signal pickup device in an apparatus for reproducing an information signal recorded on a track on a rotary recording medium in a horizontal surface, said signal pickup device comprising:
a reproducing stylus for tracking the track on the rotary recording medium thereby to reproduce the information signal;
a cantilever provided at a free distal end thereof with the reproducing stylus;
means for supporting said cantilever so as to be rotatable about substantially proximal root end thereof and movable in an longitudinal direction thereof;
coil means including at least two movable coils fixed to said support means;

means for generating a control signal current in response to deviation of the tracing position of said reproducing stylus from a track to be traced, and supplying the control signal to said coils; and

magnetic field forming means secured at a predetermined position of a main body of the device and adapted to apply to said coils a magnetic field in a direction parallel with the rotary recording medium,

said coils undergoing a motion due to a mutual interaction between the magnetic field and the current flowing therethrough, whereby said reproducing stylus is displaced by way of said cantilever at least in the width of said track and is thereby tracking controlled.

4,160,269

APPARATUS FOR OPTICALLY READING A PHASE-MODULATED OPTICAL RECORD CARRIER

Pieter Kramer; Klaas Compaan, both of Eindhoven, Netherlands, and Robert F. K. Forsthuber, Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

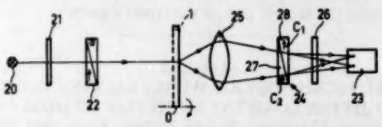
Division of Ser. No. 618,215, Sep. 30, 1975, Pat. No. 4,041,530, which is a continuation of Ser. No. 396,399, Sep. 12, 1973, abandoned, which is a continuation of Ser. No. 229,285, Feb. 25, 1972, abandoned. This application May 27, 1977, Ser. No. 801,018

Claims priority, application Netherlands, Mar. 4, 1971, 7102863

The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.

Int. Cl.[2] H04N *5/76*; G11B *7/12*

U.S. Cl. 358—128 **14 Claims**



1. Apparatus for detecting with a light beam information stored in a disc-shaped record carrier provided with a spiral pattern of regions having flat, substantially parallel upper surfaces of variable length separated by flat, substantially coplanar areas of variable length, where the plane of the areas is parallel to the plane of the regions and is separated therefrom by an amount sufficient to introduce a phase difference of nL/2 between portions of the light beam which coact with the flat areas and those which coact with the regions, where n is a positive odd integer and L is a wavelength of the light beam; the apparatus comprising means for directing the light beam to the record carrier, whereby the beam is modulated by the stored information; and a radiation-sensitive detection system means for converting the modulated beam from the record carrier into an electrical signal corresponding to the information.

4,160,270

TRACKING SERVO SYSTEM FOR VIDEO DISC PLAYER/RECORDER

Arthur M. Goldschmidt, Moorestown, and Lee V. Hedlund, Cinnaminson, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 22, 1977, Ser. No. 835,589

Int. Cl.[2] H04N *5/76*; G11B *17/00, 21/10*

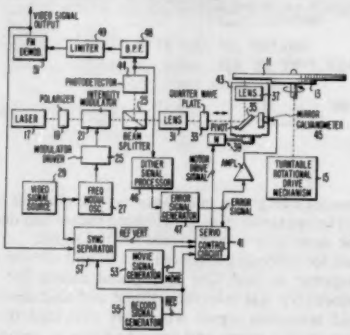
U.S. Cl. 358—128 **7 Claims**

1. In a disc record recorder/player system selectively operable in either of an information recording mode or an information playback mode, said system comprising: a turntable; means for producing a focused beam of light; and means for detecting the leading, lagging or centered position of a scanning spot imaged by the beam on a record carried by said turntable with respect to an information track of such record during system operation in said playback back mode; an apparatus comprising the combination:

means for establishing radial relative motion between said focused beam and said turntable;

means providing an output pulse train of a given frequency, said pulse train having a given number of pulses in a given time interval, for normally energizing said motion establishing means in a manner providing a first constant rate radial relative motion;

first means for altering the given number of pulses in said given time interval provided in said output pulse train by said energizing means in a manner providing said motion establishing means with radial relative motion at a second rate which is lesser than said first rate, in response to the occurrence of spot leading position detection during system operation in said playback mode;



second means for altering the given number of pulses in said given time interval provided in said output pulse train by said energizing means in a manner providing said motion establishing means with radial relative motion at a third rate which is greater than said first rate, in response to the occurrence of spot lagging position detection during system operation in said playback mode; and

means for preventing said first and second altering means from affecting the given number of pulses in said time interval of said output pulse train of said energizing means in response to the occurrence of either (a) spot centered position detection during system operation in said playback mode, or (b) system operation in said recording mode.

4,160,271

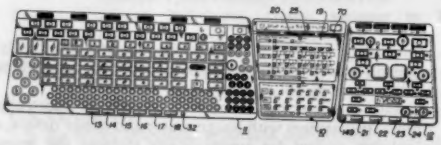
COSMETIC SELECTION AND DISPLAY SYSTEM

Suzanne Grayson, Englewood, N.J., and Dora Schaefer, New York, N.Y., assignors to Helena Rubinstein, Inc., New York, N.Y.

Filed Oct. 21, 1977, Ser. No. 844,300

Int. Cl.[2] A45D *44/00*; G06F *3/00*

U.S. Cl. 364—400 **17 Claims**



1. A cosmetic selection device, comprising:

a numerical accumulator;

a keyboard comprising a first series of rows of keys for generating first coded signals representing numerical values corresponding to various personal color character-

istics, and a second series of rows of keys for generating second coded signals representing numerical values corresponding to various personal skin characteristics;

means for coupling said first and second coded signals to said accumulator to cause said accumulator to store (i) a color index signal having a value corresponding to the algebraic sum of the values corresponding to said first coded signals, and (ii) a skin index signal having a value corresponding to the algebraic sum of the values corresponding to said second coded signals,

said color index signal being indicative of selected ones of a group of skin color imparting cosmetics most suitable for use by an individual having said personal color characteristics, and said skin index signal being indicative of selected ones of a group of skin preparation cosmetics most suitable for use by an individual having said personal skin characteristics;

first selection means for designating the suitable selected ones of said color imparting cosmetics corresponding to said color index signal; and

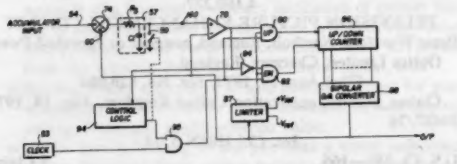
second selection means for designating the suitable selected ones of said skin preparation cosmetics corresponding to said skin index signal.

4,160,272

DIGITAL VOLTAGE ACCUMULATOR

Frank J. Thomas, Wellesley Hills, Mass.; Donald L. Gay, Daytona Beach, and Chester A. Winsor, Orlando, both of Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Filed Jan. 5, 1978, Ser. No. 867,214
Int. Cl.[2] G06J *1/00*
U.S. Cl. 364—602 **12 Claims**



1. A signal accumulator functioning to store a signal over an extended period of time, the stored signal representing the accumulated sum of values of an input signal as sampled over a plurality of processing cycles, comprising:

storage means for storing an electrical signal,

means for receiving an input signal,

summing means for producing the arithmetic sum of said stored electrical signal and said received input signal,

comparator means for comparing said stored signal with the sum signal output for said summing means, the output from said comparator means being indicative of the relative levels of the inputs thereto,

said signal storage means being interconnected with said summing means and said comparator means, with such interconnection representing a feedback arrangement for supplying said stored signal to said summing means and said comparator means,

means, responsive to said comparator output, for modifying the stored electrical signal in accordance with the varying values of said sampled input signal, and

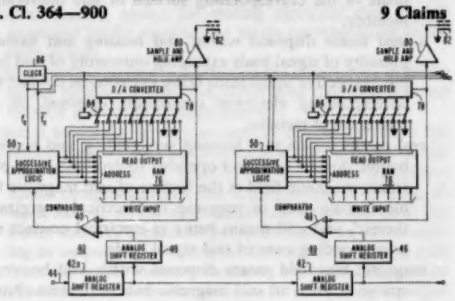
control means for selectively enabling said stored signal modifying means during a processing cycle to modify the value of the stored signal in accordance with the value of the input signal during the processing cycle as compared to the value of signal stored in the storage means during a previous processing cycle.

4,160,273

DIGITAL MEMORY ADDRESSING SYSTEM

Frank J. Marlowe, Kingston, and Robert H. Dawson, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 16, 1977, Ser. No. 852,086
Int. Cl.[2] G11C *8/00*
U.S. Cl. 364—900 **9 Claims**



1. A system for addressing a digital memory with an analog signal and for converting the digital output of the memory to an analog signal, said system comprising:

a digital to analog converter;

a comparator having a first input terminal connected to the output terminal of the digital to analog converter and a second input terminal connected to the analog addressing signal;

means for generating a digital number in response to the output signal from the comparator, said means having an output terminal for coupling the digital number to the addressing input terminal of the memory; and

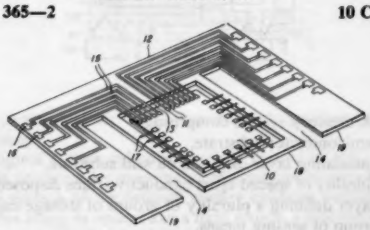
means for alternately switching the input terminal of the digital-to-analog converter to the output terminal of the digital memory and to the output terminal of the means for generating the digital number.

4,160,274

SINGLE CHIP MOLDED MAGNETIC BUBBLE MEMORY PACKAGE

Alvis D. Stephenson, Jr., Dallas, and James T. Carlo, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 20, 1976, Ser. No. 752,039
Int. Cl.[2] G11C *5/04*
U.S. Cl. 365—2 **10 Claims**



1. A packaging assembly for magnetic bubble domain chips comprising:

a housing,

an insulating interconnect member disposed within said housing, said interconnect member being provided with an aperture extending through a central portion thereof and having a pattern of electrical conductors disposed thereon, the central portion of said interconnect member being coplanar with the remainder of said interconnect member,

a magnetic bubble domain chip mounted in the central por-

tion of said interconnect member within the aperture defined therethrough in supported relationship, said magnetic bubble domain chip being in electrical contact with said electrical conductors disposed on said interconnect member and its surface lying substantially in the same plane of the corresponding surface of said interconnect member,

a lead frame disposed within said housing and having a plurality of signal leads extending outwardly of said housing, respective signal leads being in electrical contact with corresponding electrical conductors disposed on said interconnect member,

coil means within said housing surrounding said magnetic bubble domain chip and operable to produce an in-plane rotary magnetic field at the surface of said magnetic bubble domain chip in response to electrical energization thereof, said coil means being in electrical contact with corresponding ones of said signal leads,

magnetic bias field means disposed within said housing in spaced relation to said magnetic bubble domain chip for producing a magnetic field at least substantially perpendicular to the surface of said magnetic bubble domain chip, and

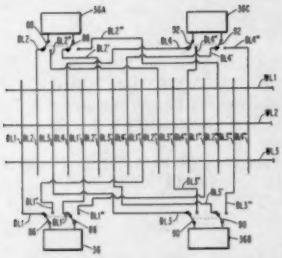
a body of insulating material filling said housing and in which said interconnect member, said magnetic bubble domain chip, said coil means, and said magnetic bias field means are embedded.

4,160,275

ACCESSING ARRANGEMENT FOR MEMORIES WITH SMALL CELLS

Hsing-San Lee, Williston; Wilbur D. Pricer, Burlington, and Norbert G. Vogl, Jr., Colchester, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,605
Int. Cl.[2] G11C *11/24, 7/06*
U.S. Cl. 365—149 **11 Claims**



1. A memory system comprising:

a semiconductor substrate,

an insulating layer disposed on said substrate,

a plurality of spaced apart conductive films disposed on said layer defining a plurality of groups of storage capacitors,

a group of sensing means,

means including a conductive strip disposed on said insulating layer between said films to cause conduction between the capacitors within each of said groups of capacitors,

a plurality of charge source means,

means for applying charges from one of said plurality of charge source means to a selected group of said plurality of groups of storage capacitors while isolating the other of said plurality of groups of capacitors from said plurality of charge source means, and

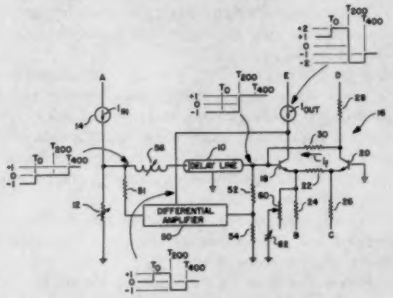
means for coupling said group of sensing means to said selected group of capacitors to sense charge displacement in the capacitors of said selected group.

4,160,276

APERTURE CORRECTION CIRCUIT

Daniel G. Baker, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 31, 1977, Ser. No. 846,742
Int. Cl.[2] H04N *5/14*
U.S. Cl. 358—162 **6 Claims**



2. A variable aperture corrector circuit for correcting aperture distortion in a television video signal, comprising:

a delay line having an input terminal responsive to the television signal and an output terminal for supplying a delayed television video signal;

means operatively disposed between said input terminal and said output terminal for comparing the signal levels at said terminals to provide a correction output signal; and

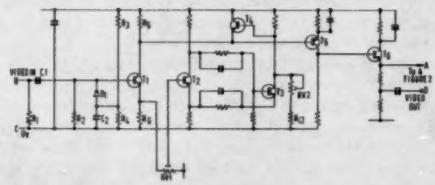
termination means coupled to said output terminal of said delay line for providing a negative terminating impedance to compensate for losses in said delay line.

4,160,277

TELEVISION PICTURE ENHANCEMENT CIRCUIT

Peter Worsfold, Northolt, England, assignor to Evershed-Power Optics Limited, Chertsey, England

Filed Aug. 19, 1977, Ser. No. 826,086
Claims priority, application United Kingdom, Aug. 19, 1976, 34637/76
Int. Cl.[2] H04N *5/14*
U.S. Cl. 358—166 **5 Claims**



1. An image-responsive apparatus for generating a signal suitable for application to a television receiver to enhance the video picture thereof, comprising:

(a) a television camera for generating an output signal representative of a scanned scene,

(b) means for controlling the response of the camera to input light reflected from the scene,

(c) a signal attenuating circuit connected in series between the camera and a video output line for attenuating selected portions of a video signal in response to a control signal applied thereto,

(d) control means for generating a control signal when the camera output signal exceeds a predetermined threshold value,

(e) means coupling the camera output signal to an input of

the control means prior to the application of the camera output signal to the attenuating circuit,

(f) means coupling an output signal from the control means to the attenuating circuit, whereby the attenuation circuit reduces the maximum amplitude of the signal applied to the video output line to a given value below the threshold value when the camera output signal is above said threshold value, and

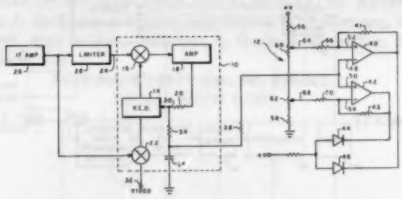
(g) means coupling the output of the attenuating circuit to the means for controlling the response of the camera.

4,160,278

FINE TUNING INDICATOR FOR TV WITH SYNCHRONOUS DETECTOR

Ronald C. Nelson, Forest Park, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 12, 1977, Ser. No. 859,420
Int. Cl.² H04N 5/50
U.S. Cl. 358—192 **8 Claims**



1. In combination in a television receiver;

a synchronous detector receiving a variable frequency input signal and generating a variable DC control voltage when locked to the frequency of the input signal, said control voltage having a predetermined value when the input signal is of a nominal frequency indicative of proper tuning of the receiver and having values which deviate from said predetermined value in accordance with deviations from the nominal frequency of the input signal; and

indicating means responsive to said control voltage for generating a visual indication of the deviation of said control voltage from said predetermined value,

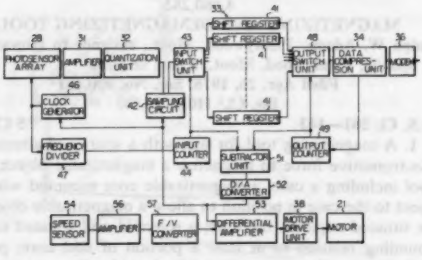
whereby said indicating means provides a visual indication of the deviation from proper tuning of the television receiver.

4,160,279

OPTOELECTRONIC READING APPARATUS

Jyoichi Fuwa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 27, 1977, Ser. No. 836,973
Claims priority, application Japan, Sep. 29, 1976, 51-116905
Int. Cl.² H04N 1/17
U.S. Cl. 358—288 **11 Claims**



1. An optoelectronic reading apparatus comprising:

photosensor means;

optical means for focussing a light image of a portion of an original document onto the photosensor means;

scan drive means for producing relative scanning movement between the document, optical means for photosensor means;

buffer memory means for storing electrical data signals produced by the photosensor means corresponding to the light image;

data compression means for reading the data signals from the buffer memory means and performing data compression thereon in a predetermined manner;

control means for sensing an amount of data signals in the buffer memory and controlling a scanning speed of the scan drive means in accordance therewith, the control means comprising input rate sensing means for sensing an input rate at which data signals are being stored in the buffer memory means, output rate sensing means for sensing an output rate at which the data signals are being read from the buffer memory means by the data compression means and first comparator means for comparing the input and output rates and producing an electrical analog control signal corresponding to a difference therebetween; and

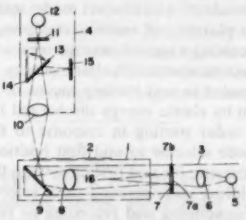
sensing means for sensing the scanning speed of the scan drive means and producing an electrical analaog speed signal corresponding thereto and second comparator means for comparing the control signal and the speed signal and adjusting a scanning speed in accordance with a difference therebetween.

4,160,280

PICTURE SCANNER WITH A SCANNING LIGHT POSITION DETECTOR

Hitomi Atoji, Kyoto; Masuo Kunisawa, Uji; Riyo Shimooka, and Seiji Okazaki, both of Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Japan

Filed Nov. 25, 1977, Ser. No. 854,698
Int. Cl.² H04N 1/24
U.S. Cl. 358—294 **1 Claim**



1. A picture scanner with a scanning light position detector comprising:

an original picture cylinder rotatable around its axis;

a light projector for scanning an original picture attached on the surface of the original picture cylinder, including in series along its optical axis a light source, a first projecting lens, a mask plate having an aperture, and a second projecting lens;

and a scanning head which receives a light beam from the original picture and includes in series a pick-up lens and a photoelectric transducer element on its optical axis;

wherein a pivot mirror and a screen are provided, and the pivot mirror is arranged between the pick-up lens and the photoelectric transducer element and can be pivoted into the optical axis of the scanning head so as to divert the light beam onto the screen, and wherein the first projecting lens is movable in the axial direction of the light projector over a range including two positions, in one of which the first projecting lens forms an image of the light

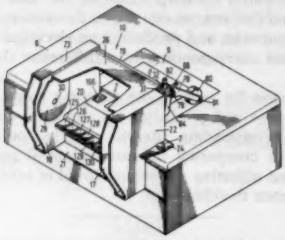
source at the focal point in front of the second projecting lens, said position being the normal operating position, and in the other position of which the first projecting lens forms an image of the light source in the plane of the mask plate, said other position being for lateral adjustment of the source, thus allowing an image of the light source superimposed on the mask to be projected onto the screen when the mirror is pivoted to the position where it diverts the light beam onto the screen.

4,160,281

CASSETTE CHANGER

Seizi Sato, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 9, 1978, Ser. No. 876,263
Claims priority, application Japan, Feb. 21, 1977, 52-17927
Int. Cl.[2] G11B *15/68, 23/04*
U.S. Cl. 360—92 **16 Claims**



1. A cassette changer for exchanging cassettes automatically in a cassette recording and/or reproducing apparatus in which an operating mode selector is moved from a first position to a second position to effect a recording or reproducing operation and said selector is returned to said first position at the end of said operation, and in which a cassette holder for holding a first cassette is movable between a recording or reproducing position and an eject position and is movable to said eject position in response to selection of an eject mode: said cassette changer comprising a plurality of resilient members; cassette loading means for receiving a second cassette; means for charging each of said resilient members with elastic energy when said second cassette is loaded in said loading means of the changer; and means driven by elastic energy discharged from said resilient members in order starting in response to the return of said operating mode selector to said first position for exchanging said second cassette for said first cassette in the cassette holder and then restoring said operating mode selector to said second position for continuing said recording or reproducing operation with said second cassette.

4,160,282

OVERCURRENT PROTECTION APPARATUS

Kevin D. Dolinar, Canonsburg, and John F. Burr, Pittsburgh, both of Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Filed Oct. 3, 1977, Ser. No. 838,735
Int. Cl.[2] H02H *7/085*
U.S. Cl. 361—31 **12 Claims**

1. Apparatus for detecting an overcurrent flowing through a conductor and protecting the conductor from the overcurrent comprising,

a circuit breaker adapted to be connected in series with a direct current conductor,

said circuit breaker being operable in a closed position to permit the flow of direct current through the conductor and in an open position to terminate the flow of direct current through the conductor,

a shunt adapted to be connected in series with the conductor so that direct current flows through said shunt to the conductor,

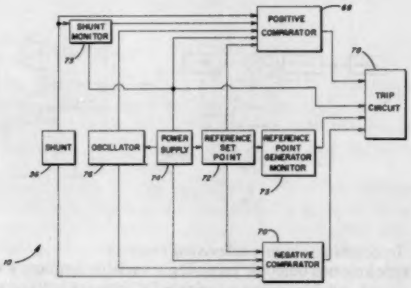
said shunt being operable to generate an input signal at a voltage proportional to the direct current flowing through the conductor,

reference means for generating a reference signal at a voltage of a magnitude proportional to the maximum direct current permitted to flow through the conductor,

a monitor circuit connected to said reference means and said circuit breaker for monitoring the operability of said reference means to generate a reference signal,

said monitor circuit being responsive to said reference signal generated by said reference means to actuate said circuit breaker to close and thereby permit the flow of direct current through the conductor,

said monitor circuit being operable upon failure of said reference means to generate a reference signal to open said circuit breaker and prevent flow of direct current through the conductor,



comparator means connected to receive the input signal from said shunt and the reference signal from said reference means,

said comparator means being operable to generate an output signal in response to the magnitude of the input signal and the reference signal from said shunt and said reference means respectively,

a trip circuit connected to receive the output signal from said comparator means,

said trip circuit including a relay, and

said relay being normally energized by the output signal of said comparator means to normally maintain said circuit breaker in a closed position and permit direct current flow through said circuit breaker so that when the input signal from said shunt exceeds the reference signal from said reference means the output signal of said comparator means is terminated and said relay is deenergized to open said circuit breaker and terminate flow of direct current through said circuit breaker and the conductor.

4,160,283

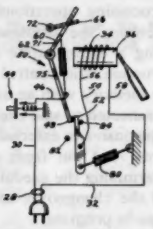
MAGNETIZING AND DEMAGNETIZING TOOL

Ralph W. Adams, Plentywood, Mont., assignor to Howard A. Spoklie, Plentywood, Mont., a part interest

Filed Apr. 26, 1978, Ser. No. 900,151
Int. Cl.[2] H01F *13/00*
U.S. Cl. 361—143 **5 Claims**

1. A magnetizing tool for use with a source of alternating electromotive force to magnetize a magnetizable object, said tool including a case; a magnetizable core mounted with respect to the case in position to allow a magnetizable object to be situated adjacent the core; a solenoid coil situated in surrounding relation to at least a portion of said core; power switch means for connecting said solenoid coil across a source of alternating electromotive force; and a normally closed dwell

switch in series with said coil and activated by magnetization of said core to move to an open condition to interrupt flow of



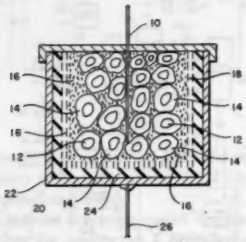
electrical energy through said solenoid after first permitting current to flow in said solenoid for a short period of time.

4,160,284

CAPACITORS AND PROCESS FOR MAKING SAME

Robert J. Deffeyes, Arlington, and Harris W. Armstrong, Fort Worth, both of Tex., assignors to Graham Magnetics, Inc., Graham, Tex.

Filed Jul. 27, 1977, Ser. No. 819,362
Int. Cl.[2] H01G 9/00
U.S. Cl. 361—433 **12 Claims**



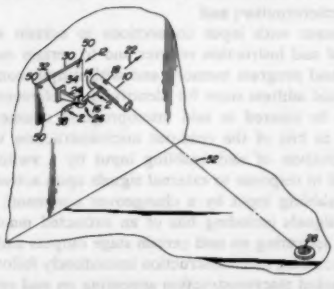
1. A capacitor of the type comprising a porous mass of dielectric oxide-coated metal between an anode and a cathode, said oxide forming the dielectric of said capacitor, the improvement wherein said porous mass is impregnated with an electroconductive metal powder-containing paste, said powder having an average diameter of less than about 1 micron.

4,160,285

POINT LOCATING APPARATUS

James N. Shibla, 78 Aronimink Pl., Macungie, Pa. 18062

Filed Aug. 12, 1977, Ser. No. 823,895
Int. Cl.[2] F21S 1/02
U.S. Cl. 362—145 **10 Claims**



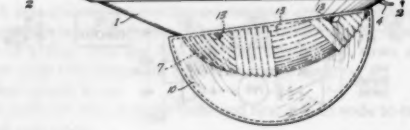
1. Apparatus for locating a point, such as an oil fill pipe or the like, on a reoccurring basis, comprising: a collimated light source, bracket means having a structure adapted for permanent mounting to a permanent structure in the vicinity of the point to be located on a reoccurring basis, said bracket means including a keyed mounting means for slidably removably mounting a mating portion of said collimated light source, said keyed mounting means being at least partially positionable with respect to two orthogonal directions whereby said collimated light source may be directed at the point to be located in the future, means for locking said keyed mounting means in a predetermined position such that said collimated light source is directed at the point to be relocated when said bracket is permanently mounted to said permanent structure, said collimated light source being slidably removable from said keyed mounting means of said bracket and slidably mountable on said keyed mounting means at a later time when said point is to be relocated.

4,160,286

LUMINAIRE SHIELD

William H. Merritt, Seattle, Wash., assignor to Plastics Engineering & Manufacturing Co., Seattle, Wash.

Filed Jul. 18, 1977, Ser. No. 816,451
Int. Cl.[2] F21V 13/02, 3/02, 3/04
U.S. Cl. 362—311 **11 Claims**



1. In a luminaire including a frame, a door connected to the frame, a light-diffusing lens mounted in an aperture in the door and light-producing means enclosed by the frame, door and lens, the improvement comprising a transparent shell at the side of the lens opposite the light-producing means for protecting the lens, a flange projecting inward from the margin of said shell, and means for securing said flange to the luminaire door.

4,160,287

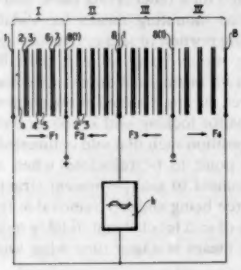
ELECTROLYZER POWER SUPPLY

Nicole Chillier-Duchatel, Sevres, and Bernard Verger, Chevreuse, both of France, assignors to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie", Paris, France

Continuation-in-part of Ser. No. 748,283, Dec. 7, 1976, abandoned. This application Jun. 2, 1977, Ser. No. 802,625
Claims priority, application France, Dec. 12, 1975, 75 38151
Int. Cl.[2] H02M 7/28
U.S. Cl. 363—13 **14 Claims**

1. An electrolyzer power supply comprising a bridge rectifier circuit having four rectifying arms, each arm comprising a filter press structure group of series connected rectifying electrolyzer cells to form a full-wave bridge rectifier circuit, each of said series connected electrolyzer cells including a first negative electrode having a rectifying effect and a second counter-electrode and an electrolyte therebetween, the second electrode of a cell being electrically connected to the first electrode of the next series connected cell; said four groups being connected in series with first and second groups in series aiding and third and fourth groups in series aiding, the polarities of said first and second groups being connected with opposite polarities relative to said third and fourth groups, the end

electrodes of said filter-press structure being interconnected to form an input electrode of the rectifier bridge and the other



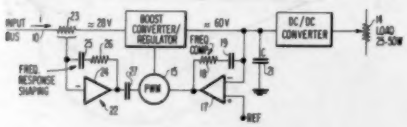
electrodes of the bridge comprising the intermediate end electrodes of said groups.

4,160,288

ACTIVE FILTER CIRCUIT FOR REGULATED DC TO DC POWER SUPPLIES

Kenneth L. Stuart, Riviera Beach, and William E. Baker, Jr., Frederick, both of Md., assignors to Communications Satellite Corp., Washington, D.C.

Filed May 17, 1978, Ser. No. 906,706
Int. Cl.[2] H02M *1/14, 3/335*
U.S. Cl. 363—41 **5 Claims**



1. In a regulated DC to DC power supply of the type having an input bus for supplying a first predetermined DC voltage, regulator means connected to said input bus for converting said first predetermined DC voltage to a second predetermined DC voltage at an output of said regulator means, voltage feedback means connected to said output for generating a control signal to said regulator means which regulates said second predetermined DC voltage for changes having a first predetermined frequency range, and means for connecting said output to a variable load which exhibits a low frequency cyclical power change, the improvement comprising an input bus current-sensing servo means for generating a control signal to said regulator means which regulates the input current to said regulator means, thereby regulating said second DC voltage for changes having a second predetermined frequency range, said low frequency being above said first predetermined frequency range but within said second predetermined frequency range.

4,160,289

MICROPROGRAM-CONTROL UNIT FOR DATA PROCESSOR

Mario Bambara, Milan, and Adriano Querze, Castelfranco Emiliano, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Oct. 6, 1977, Ser. No. 839,883
Claims priority, application Italy, Oct. 7, 1976, 28067 A/76
Int. Cl.[2] G06F *9/16, 9/20*
U.S. Cl. 364—200 **16 Claims**

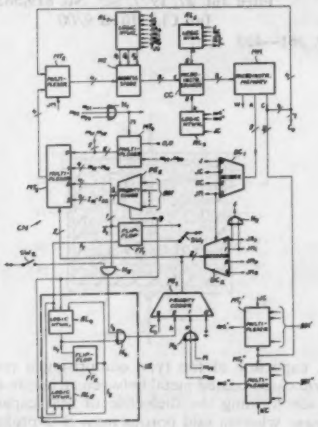
1. In an electronic data processor serving a number of peripheral units and including a program memory containing binary macroinstructions, a program counter steppable to make the bits of successive macroinstructions of a given program available at respective output leads of said program memory, an instruction register with respective stages connected to said output leads for temporarily storing a current macroinstruction extracted from said program memory, and execution means connected to said instruction register for carrying out data-processing operations specified by the extracted macroinstructions, the combination therewith of a control unit executing a microroutine for carrying out any extracted macroinstruction, said control unit comprising:

a microinstruction memory with an address input and with output means connected to said execution means;

logical circuitry responsive to external signals and to microinstruction words read out from said microinstruction memory for determining the execution of a microroutine in progress and the changeover to a new microroutine following the one in progress;

a microprogram counter having an output connected to said address input for identifying successive microinstruction words for readout from said microinstruction memory;

an address store connected to a loading input of said microprogram counter for supplying same with a reference address, said microprogram counter further having a stepping input activable for progressively incrementing the reference address last entered therein and an enabling



input activable to replace the latter address with one appearing in said loading input;

decoding means in said logical circuitry connected to said output means for generating switching signals alternatively activating said stepping and enabling inputs in response to the microinstruction words read out during a microroutine, said decoding means generating a changeover command invariably activating said enabling input in response to a final microinstruction word read out at the end of a microroutine; and

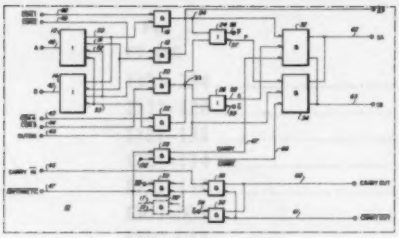
selection means with input connections to certain stage outputs of said instruction register and to certain output leads of said program memory and with output connections to said address store for identifying a reference address, to be entered in said microprogram counter, in response to bits of the read-out microinstruction word upon activation of said enabling input by a switching signal and in response to external signals upon activation of said enabling input by a changeover command, said external signals including bits of an extracted macroinstruction appearing on said certain stage outputs and bits of a forthcoming macroinstruction immediately following said extracted macroinstruction appearing on said certain output leads.

4,160,290

ONE-BIT MULTIFUNCTION ARITHMETIC AND LOGIC CIRCUIT

Rolfe D. Armstrong, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Apr. 10, 1978, Ser. No. 894,795
Int. Cl.[2] G06F *7/50;* H03K *19/08*
U.S. Cl. 364—716 21 Claims



1. An arithmetic circuit having first and second arithmetic inputs, a plurality of control inputs, and a carry in input, said arithmetic circuit comprising:

(a) first and second inverting means responsive to the arithmetic inputs for producing a plurality of wire OR-able inverting outputs and non-inverting outputs;

(b) first, second, third, and fourth two-input NOR gates each having a wire OR-able output and a first input responsive to a respective one of the control inputs and a second input responsive to respective ones of the plurality of wire OR-able inverting outputs and non-inverting outputs of said first and second inverting means;

(c) first means responsive to the wire OR-able outputs of said first and second two-input NOR gates and said third and fourth two-input NOR gates for producing a propagate signal and a generate signal respectively; and

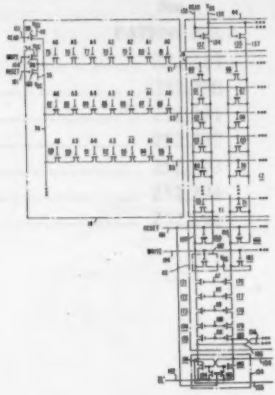
(d) second means responsive to a carry signal, to said propagate signal, to said generate signal, and to the output of said first two-input NOR gate for producing a sum output.

4,160,291

PRECHARGE CIRCUITRY FOR AN ELECTRICALLY ALTERABLE NON-VOLATILE MEMORY

Philip C. Smith, Laurel, and John L. Fagan, Pasadena, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 837,791, Sep. 29, 1977, Pat. No. 4,124,900.
This application Jul. 31, 1978, Ser. No. 929,626
Int. Cl.[2] G11C *7/00*
U.S. Cl. 365—203 3 Claims



1. A non-volatile semiconductor memory array row decoder for precharging a plurality of rows of memory cells in said array at a first time and for selecting one of said rows at a second time following said first time comprising,

a first circuit node,

a plurality of circuit paths from said first circuit node to each of said rows,

each of said circuit paths including a plurality of field effect transistors, each having a gate, source and drain electrode, connected in series between the source and drain electrodes,

means for coupling a plurality of address signals to said gates of said transistors to cause one circuit path to conduct current in response to said plurality of address signals,

each address signal may be represented by its true or complement level,

means for coupling said first circuit node to a first supply voltage in response to a write signal,

means for coupling said first circuit node to a second supply voltage in response to a read signal, and

means for coupling said first circuit node to a third supply voltage in response to a reset signal to precharge to a predetermined voltage through said plurality of said circuit paths, said plurality of rows at times when the potential of said plurality of address signals are all at a voltage to cause said transistors to conduct current.

DESIGN PATENTS

GRANTED JUL. 3, 1979

ERRATA

For CLASS	See PATENT NO.
D21–234	252,289
D21–128	252,290
D21–131	252,291
D21–114	252,292
D21–114	252,293
D03–039	252,294
D20–041	252,295

DESIGNS

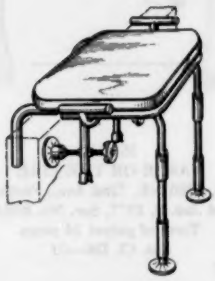
JULY 3, 1979

252,236
SHOELACE TASSLE
David N. McCrary, 1304 Leone Ave., Valdosta, Ga. 31601
Filed May 9, 1977, Ser. No. 784,162
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—316

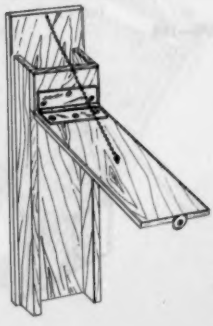
252,237
INCLINABLE BENCH
Anthony J. Demaio, North Hollywood, Calif., assignor to Marcy Gymnasium Equipment Company, Glendale, Calif.
Filed Mar. 28, 1977, Ser. No. 781,673
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—17

252,238
CHAIR
Lorraine A. Van Sant, 111 16th St. North, Wisconsin Rapids, Wis. 54494
Filed Apr. 25, 1977, Ser. No. 790,463
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

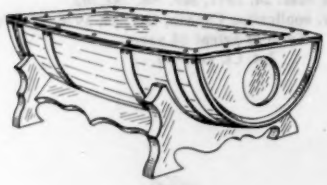
252,239
TUBSEAT
Harold M. Smith, 437 Charlotte St., London, Ontario, Canada (N5W 4A5)
Filed Mar. 28, 1977, Ser. No. 781,702
Claims priority, application Canada, Oct. 25, 1976, 2510764
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—86



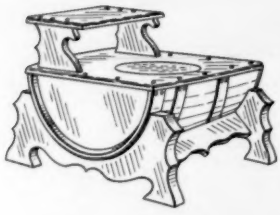
252,240
WALL MOUNTED CLOTHES HANGER
Ray Barr, and Roxye Hamilton, both of 622 E. Main St., Florence, Colo. 81226
Filed Aug. 30, 1977, Ser. No. 829,158
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—124



252,241
COFFEE TABLE OR THE LIKE
Scott T. Nicolson, 5286 NE. 72nd Ave., Portland, Oreg. 97218
Filed Jun. 9, 1977, Ser. No. 805,086
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—147

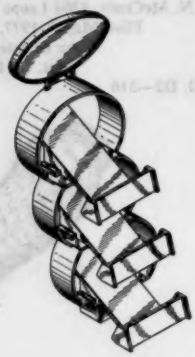


252,242
TABLE OR THE LIKE
Scott T. Nicolson, 5286 NE. 72nd Ave., Portland, Oreg. 97218
Filed Jun. 9, 1977, Ser. No. 805,088
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—147

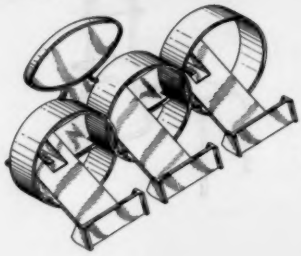


252,243
CABINET
Morton L. Reitman, Pepper Pike, Ohio, assignor to The AAV Companies, Solon, Ohio
Filed Jul. 18, 1977, Ser. No. 816,351
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—168

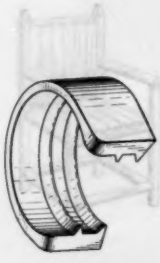
252,244
COUNTER DISPLAY STAND
Sydney Edson, East Meadow, N.Y., assignor to Howard Displays, Inc., New York, N.Y.
Filed Mar. 18, 1977, Ser. No. 778,908
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—186



252,245
COUNTER DISPLAY STAND
Sydney Edson, East Meadow, N.Y., assignor to Howard Displays, Inc., New York, N.Y.
Filed Mar. 18, 1977, Ser. No. 778,909
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—186

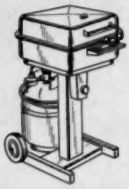


252,246
MIRROR CLIP
Robert J. Christian, 3500 Hillcrest Dr., Waco, Tex. 76708
Filed Nov. 4, 1977, Ser. No. 848,664
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—246

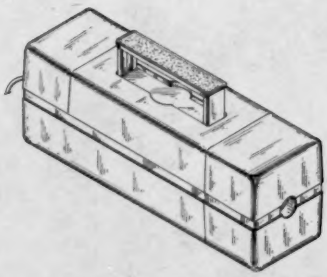


252,247
CARPET-LINED COASTER FOR BEVERAGE GLASSES
John E. Chiotte, 91 E. Bonita Ave., Sierra Madre, Calif. 91024
Filed Dec. 16, 1977, Ser. No. 861,195
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—45

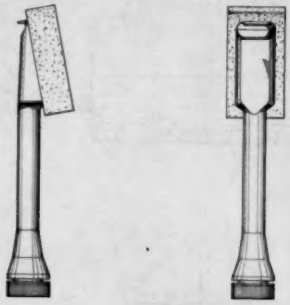
252,248
GAS BARBEQUE GRILL
George L. Huff, Greeneville, Tenn., assignor to Metals Engineering Corporation, Greeneville, Tenn.
Filed Sep. 28, 1977, Ser. No. 837,592
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—108



252,249
HAND-HELD VACUUM CLEANER
Marvin Cooper, New Rochelle, N.Y., assignor to Dynamic Classics, Ltd., New York, N.Y.
Filed Nov. 30, 1977, Ser. No. 856,198
Term of patent 14 years
Int. Cl. D7—*05*; D15—*05*
U.S. Cl. D7—164

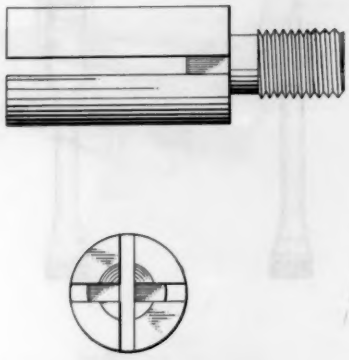


252,250
LIQUID SOAP DISPENSER
Leonard E. Hobbs, 719 Ocean Blvd., Apt. 410, Pompano Beach, Fla. 33062
Filed Jul. 5, 1977, Ser. No. 813,126
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—179



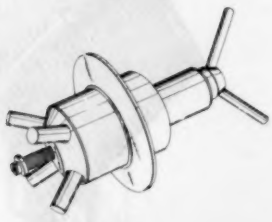
252,251
PLATE RACK
Per A. Lundahl, Gula Kvarnen i Aby, 360 40 Rottne, Sweden, assignor to Terrs i Wexiö AB, Rottne, Sweden
Filed May 10, 1977, Ser. No. 795,662
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—188

252,252
HEAD FOR A SCREW JIG POLE
Noble H. Abney, 580 Weddell Dr., No. 1, Sunnyvale, Calif. 94086
Filed Apr. 1, 1977, Ser. No. 783,951
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—87

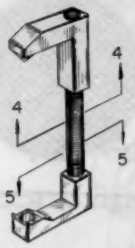


252,253
SCREW JIG POLE
Noble H. Abney, 580 Weddell Dr., No. 1, Sunnyvale, Calif. 94086
Filed Apr. 1, 1977, Ser. No. 783,952
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—87

252,254
HUB ASSEMBLY, PARTICULARLY FOR A CABLE DRUM WHEEL
Oswald Westin; Owe Westin, and Jan Westin, all of Föreningsgatan 11, S-951 43 Luleå, Sweden
Filed May 26, 1977, Ser. No. 800,945
Claims priority, application Sweden, Dec. 2, 1976, 762344
Term of patent 7 years
Int. Cl. D8—*99*
U.S. Cl. D8—358



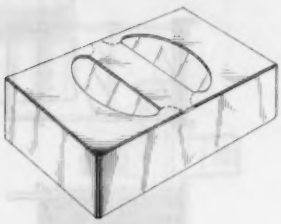
252,255
EXHAUST MANIFOLD CLAMP
Richard Uyeda, 416 E. Prairie St., Marengo, Ill. 60152
Filed May 16, 1977, Ser. No. 797,560
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—394



252,256
TEMPERATURE PRESET CLIP FOR A THERMOSTAT
Donald F. Kline, 12820 NE., 39th, Bellevue, Wash. 98006
Filed Jan. 24, 1977, Ser. No. 761,892
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—395

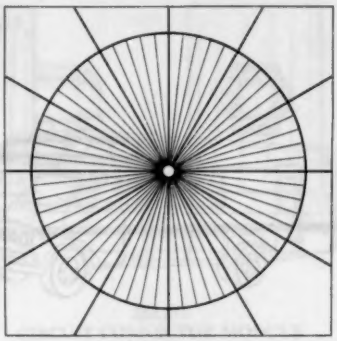
252,257
LIQUID CONTAINER
Fred R. Dobbs, Dallas, Tex., and Robert G. Squibb, Cordova, Tenn., assignors to Southeastern Steel Container Company, Birmingham, Ala.
Filed Jan. 31, 1977, Ser. No. 764,469
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—52

252,258
DISPENSING CARTON OR SIMILAR ARTICLE
Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.
Filed Feb. 25, 1977, Ser. No. 771,907
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



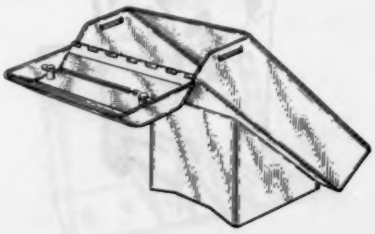
252,259
ARTICLE CARRIER BLANK
Alfred J. Rinehart, Atlanta, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Mar. 28, 1977, Ser. No. 782,501
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245

252,260
TIMEPIECE DIAL
Edwin A. Day, 607 Quackenbos St., NW., Washington, D.C. 20011
Filed Nov. 1, 1977, Ser. No. 847,680
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125



252,261
PENDANT FOR A KEY CHAIN OR THE LIKE
Arlen D. Weibert, 3127 E. Belmont, and Edwin D. Weibert, 4696 E. Clinton, both of Fresno, Calif.
Filed Oct. 11, 1977, Ser. No. 840,663
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—82

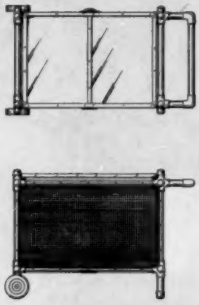
252,262
SECURITY CONTAINER FOR A CITIZENS BAND RADIO
Forrest E. Baker, 1891 Foxworthy Ave., San Jose, Calif. 95124
Filed Aug. 25, 1977, Ser. No. 827,823
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



252,263
MOTOR HOME
Gerald A. Van Stockum, 5763 Paizano Way, Riverside, Calif. 92509, and Oliver J. Hawkins, 2905 Mountain View Dr., Laguna Beach, Calif. 90031
Filed Aug. 29, 1977, Ser. No. 828,559
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—100

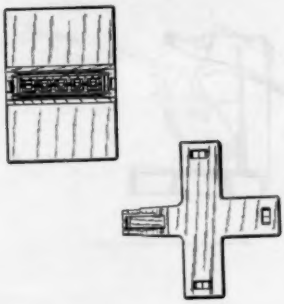
252,264
SHOPPING CART
Stephen Paterson, 106 28 Queens Blvd., Forest Hills, N.Y. 11375
Filed Oct. 17, 1977, Ser. No. 842,670
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—33

252,265
TRASH CART OR THE LIKE
Jerry N. Gardner, 3149 Stratton Rd., Jacksonville, Fla. 32221
Filed Apr. 17, 1978, Ser. No. 897,525
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—33

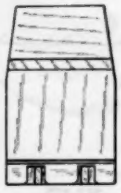


252,266
WHEEL
Hirotsune Taitani, Seto, and Yoshihiro Hamasaki, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Jun. 29, 1977, Ser. No. 811,368
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

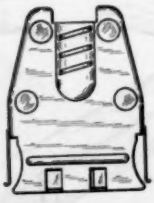
252,267
CIRCUIT CONNECTOR MODULE
Nils G. Jonsson, Woburn, Mass., assignor to National Service Industries, Inc., Atlanta, Ga.
Continuation-in-part of Ser. No. 837,756, Sep. 29, 1977. This application Jan. 16, 1978, Ser. No. 869,481
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



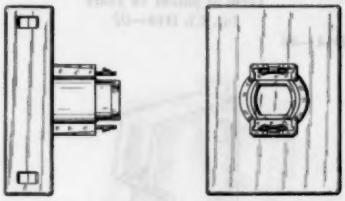
252,268
ELECTRICAL CONNECTOR
Nils G. Jonsson, Woburn, Mass., assignor to National Service Industries, Inc., Atlanta, Ga.
Filed Sep. 19, 1977, Ser. No. 834,811
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



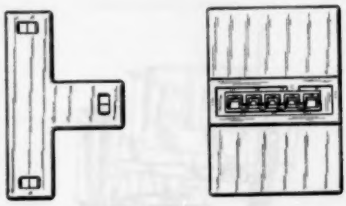
252,269
ELECTRICAL CONNECTOR
Nils G. Jonsson, Woburn, Mass., assignor to National Service Industries, Inc., Atlanta, Ga.
Filed Sep. 19, 1977, Ser. No. 834,813
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



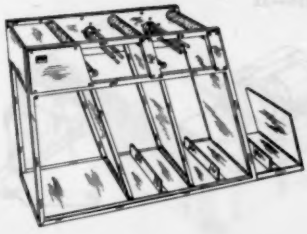
252,270
ELECTRICAL CIRCUIT CONNECTOR
Nils G. Jonsson, Woburn, Mass., assignor to National Service Industries, Inc., Atlanta, Ga.
Filed May 23, 1978, Ser. No. 908,692
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



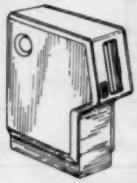
252,271
CIRCUIT CONNECTOR MODULE
Nils G. Jonsson, Woburn, Mass., assignor to National Service Industries, Inc., Atlanta, Ga.
Continuation-in-part of Ser. No. 869,481, Jan. 16, 1978, and Ser. No. 837,756, Sep. 29, 1977. This application May 23, 1978, Ser. No. 908,693
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



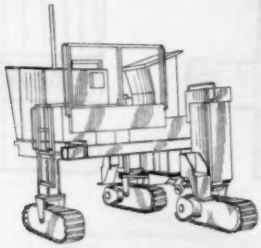
252,272
DECOLLATOR
Edward E. Barrett, Massapequa Park, N.Y., assignor to Swingline Inc., Long Island, N.Y.
Filed Jul. 13, 1976, Ser. No. 704,942
Term of patent 14 years
Int. Cl. D14—*02*; D16—*99*; D18—*99*
U.S. Cl. D18—22



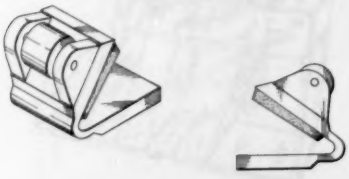
252,273
MAGNETIC DISK CONTROL UNIT FOR WORD PROCESSORS
Farouk Arjani, Foster City; Thomas J. Kramer, San Jose; Richard E. Johnson, Los Altos; Ralph M. Swan, Sunnyvale; David C. Andersen, Cupertino, and David D. Pharmer, Gilroy, all of Calif., assignors to Artec International Corporation, Palo Alto, Calif.
Filed Mar. 14, 1977, Ser. No. 777,114
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—46



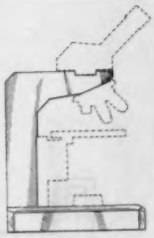
252,274
CURB FORMING MACHINE
Joseph T. Gregorich, Rockford; William C. Goers, Dundee, and Walter B. Seefeldt, Naperville, all of Ill., assignors to Barber-Greene Company, Aurora, Ill.
Filed May 2, 1977, Ser. No. 793,169
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—22

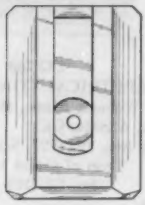


252,275
SUBSTRATE CLAMP FOR A SLITTING APPARATUS
James E. McCrea, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 2, 1977, Ser. No. 773,727
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32

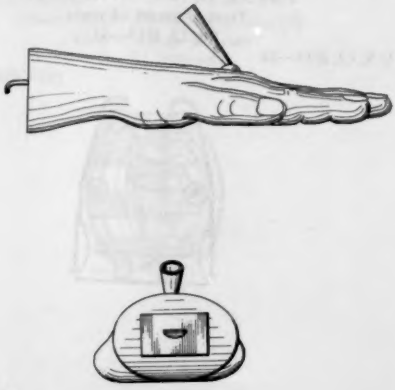


252,276
MICROSCOPE STAND
Howard A. Griffith, San Jose, Calif., assignor to Swift Instruments, Inc.
Filed Apr. 6, 1978, Ser. No. 894,050
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—57





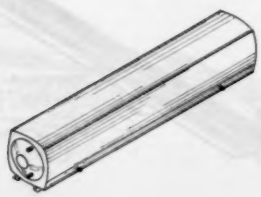
252,277
COMBINED PAPERWEIGHT AND PEN HOLDER
George O. Chaires, P.O. Box 5175, Tallahassee, Fla. 32301
Filed Apr. 18, 1977, Ser. No. 788,380
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—97



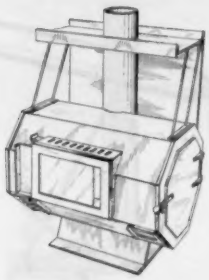
252,278
HANDLE FOR A FISHING DEVICE
Bernard J. Struntz, 1002 Woodbridge St., St. Paul, Minn. 55117
Filed Apr. 25, 1977, Ser. No. 790,562
Term of patent 3 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

252,279
FISHING LURE
Arthur F. Daws, Jr., P.O. Box 203, Brownsville, Tenn. 38012
Filed Jul. 5, 1977, Ser. No. 813,114
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

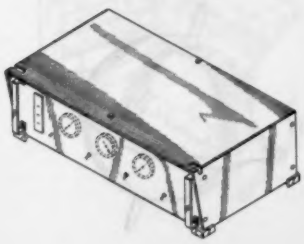
252,280
STORAGE TANK
Harry J. Riley, Perth, Australia, assignor to S. W. Hart and Co. Pty. Ltd., Australia
Filed Oct. 5, 1976, Ser. No. 729,918
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2



252,281
FIREPLACE STOVE
Duane P. Kincaid, Rte. 1, Box 471, Sandpoint, Id. 83864
Filed Jul. 7, 1977, Ser. No. 813,735
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



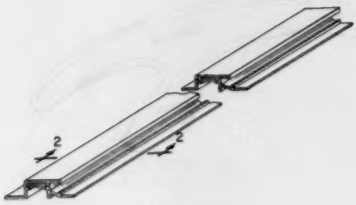
252,282
CABINET WHICH HOUSES COMPONENTS EMPLOYED IN SURGERY
Ludwig A. Wettermann, Arlington Heights, and William F. Auer, Des Plaines, both of Ill., assignors to Richard Wolf Medical Instruments Corporation, Rosemont, Ill.
Filed Dec. 23, 1977, Ser. No. 864,156
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—8



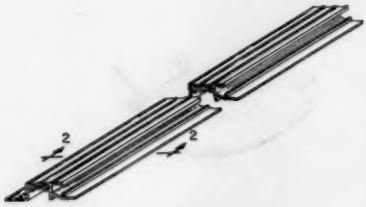
252,283
TENDON HAMMER
Ralph Reeves-Saunders, 175 Parkside Ave., Bexleyheath, Kent, DA7 6NP, England
Filed Mar. 21, 1977, Ser. No. 779,944
Claims priority, application United Kingdom, Sep. 29, 1976, 97736176; Sep. 29, 1976, 97736276; Jan. 25, 1977, 97866077
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

252,284
HEMODIALYSIS RESERVOIR OR THE LIKE
Jacques M. Calzia, Saint-Genis Laval, and Andre Sausse, Sceaux, both of France, assignors to Rhone-Poulenc Industries, Paris, France
Filed Apr. 26, 1977, Ser. No. 791,144
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—21

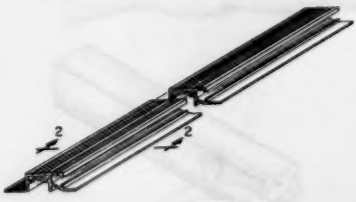
252,285
FRAME MEMBER FOR STORM WINDOWS OR THE LIKE
Warren H. Brockway, Newnan, Ga., assignor to The William L Bonnell Company, Ga.
Filed Jun. 27, 1977, Ser. No. 810,151
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



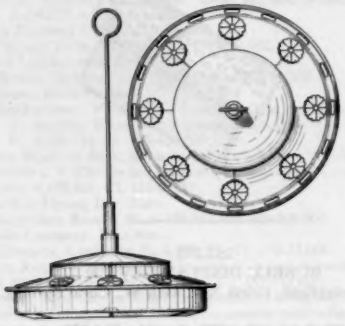
252,286
FRAME MEMBER FOR STORM WINDOWS OR THE LIKE
Warren H. Brockway, Newnan, Ga., assignor to The William L Bonnell Company, Ga.
Filed Jun. 27, 1977, Ser. No. 810,580
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



252,287
FRAME MEMBER FOR STORM WINDOWS OR THE LIKE
Warren H. Brockway, Newnan, Ga., assignor to The William L Bonnell Company, Ga.
Filed Jun. 27, 1977, Ser. No. 810,581
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

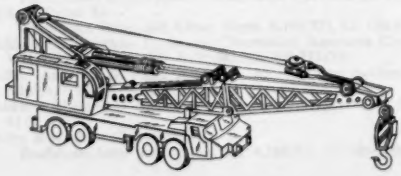


252,288
HUMMINGBIRD FEEDER
Peter Kilham, Foster, R.I., assignor to Droll Yankees, Inc., Foster, R.I.
Filed Mar. 27, 1978, Ser. No. 891,131
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—14



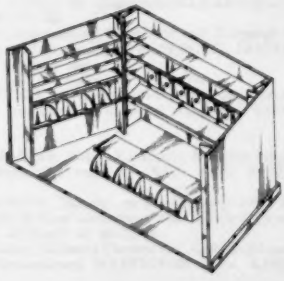
252,289
GOLF BALL MARKER BAND
Frank E. Furin, 30896 Lorain Rd., North Olmsted, Ohio 44070
Filed Nov. 28, 1975, Ser. No. 636,164
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234

252,290
TOY VEHICLE
Kiyoji Asano, 2-27-23, Sumida, Sumida-ku, Tokyo, Japan
Filed Dec. 2, 1975, Ser. No. 637,095
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—128

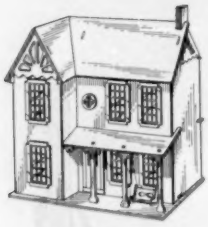


252,291
TOY VEHICLE
Kiyoji Asano, 2-27-23, Sumida, Sumida-ku, Tokyo, Japan
Filed Dec. 4, 1975, Ser. No. 637,772
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—131

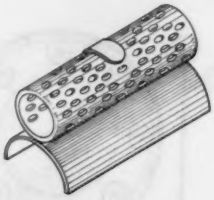
252,292
TOY STORE
Wilma I. Johnson, 692 Palisade St., Pasadena, Calif. 91103
Filed Nov. 18, 1976, Ser. No. 742,861
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—114



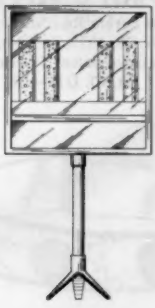
252,293
TOY HOUSE
William D. Gordon, Sr., Glenview, Ill., assignor to Arvey Corporation, Chicago, Ill.
Filed Jun. 20, 1977, Ser. No. 808,168
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—114



252,294
HAIR NET CONTAINER
Muriel A. Mack, 312 Marion Ct., Rte. 3, Rawlings, Md. 21557
Filed Jun. 16, 1977, Ser. No. 807,311
Term of patent 3 years
Int. Cl. D28—*03*
U.S. Cl. D3—39



252,295
BUBBLE DISPLAY DEVICE
Billie M. Crutchfield, 11060 NW. 44th St., Coral Springs, Fla. 33065
Filed Apr. 11, 1977, Ser. No. 786,255
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—41



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF JULY, 1979

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. L. Korr Associates, Inc.: *See*—
Korr, Abraham L.; Walker, Evan H.; and Svihel, Bernard T., 4,159,629, Cl. 60-641.000.

A-Lok Products Corporation: *See*—
Ditcher, John, 4,159,829, Cl. 277-189.000.

Abbott Laboratories: *See*—
Hauser, Stephen G., 4,159,875, Cl. 356-244.000.

Abraimov, Boris F.: *See*—
Sladkoshteev, Vladimir T.; Shatagin, Oleg A.; Khalemsky, Samuil F.; Sachko, Viktor V.; Yakunin, Ivan A.; and Abraimov, Boris F., 4,159,734, Cl. 164-426.000.

Achatz, Manfred; Beck, Rasmus; and Bockelmann, Werner, to Battelle-Institute e. V. Device and method for measuring the curvature of the cornea. 4,159,867, Cl. 351-6.000.

Acoustical Floors, Inc.: *See*—
Jorgenson, Ronald M., 4,159,912, Cl. 106-109.000.

Acricite Company, Inc.: *See*—
Schwartz, Lawrence B., 4,159,729, Cl. 150-33.000.

Adams, Ralph W., to Spoklie, Howard A., a part interest. Magnetizing and demagnetizing tool. 4,160,283, Cl. 361-143.000.

Adamson, John S., to Chevron Research Company. Transponder system including an oscillator/ripple counter controlling a fixed Gray code logic network in circuit with a decoder/driver network for generating "red alert" end condition digital signals in a storage tank gauging system. 4,160,239, Cl. 340-152.00T.

Advanced Equipment Corporation: *See*—
Dickson, Wesley B., 4,159,556, Cl. 16-87.40R.

Advanced Fireproofing Systems Limited: *See*—
Lloyd-Lucas, John B.; and Lloyd-Lucas, Christopher, 4,160,073, Cl. 521-122.000.

Agarpao, Emilio L.: *See*—
Airheart, Franklin B.; and Agarpao, Emilio L., 4,159,754, Cl. 188-71.800.

Agence Nationale de Valorisation de la Recherche: *See*—
Miquel, Jean-Francois, 4,159,707, Cl. 126-270.000.

Agnes, Giovanni; Bimbi, Giuseppe; Guerrieri, Franco; and Rucci, Guglielmo, to Montedison S.p.A. Process for the preparation of esters of oxalic acid. 4,160,107, Cl. 560-204.000.

Ahmed, Adel A. A., to RCA Corporation. Voltage regulators. 4,160,201, Cl. 323-8.000.

Airheart, Franklin B.; and Agarpao, Emilio L., to Airheart Products, Inc. Parking brake assembly. 4,159,754, Cl. 188-71.800.

Airheart Products, Inc.: *See*—
Airheart, Franklin B.; and Agarpao, Emilio L., 4,159,754, Cl. 188-71.800.

Akahane, Yoshikazu, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece having a main oscillator circuitry and secondary oscillator circuitry. 4,159,622, Cl. 58-23.0AC.

Akase, Kazutoyo; and Kobayashi, Isao, to Nippon Electric Co., Ltd. Circuit comprising an air gap for driving a laser. 4,160,190, Cl. 315-168.000.

Akers, Arthur: *See*—
Greer, Raymond T.; McConnell, Kenneth G.; and Akers, Arthur, 4,159,942, Cl. 209-143.000.

AKG Akustische u.Kino-Gerate Gesellschaft m.b.H.: *See*—
Gorike, Rudolf, 4,160,135, Cl. 179-182.00R.

Akman, Ahmet R., to Ford Motor Company. Engine ignition timing control with multi-stage advances, retard, and altitude compensation functions. 4,159,702, Cl. 123-117.00A.

Aktiebolaget SKF: *See*—
Ostling, Sture; and Persson, Stig, 4,159,828, Cl. 277-184.000.

Akzona Incorporated: *See*—
Griset, Ernest J., Jr., 4,159,619, Cl. 57-295.000.
Mone, Rudolf A. J.; and Klaver, Gijsbertus, 4,159,969, Cl. 252-463.000.
Praetorius, Heinz; Seibert, Karl; and Holtvoigt, Werner, 4,159,975, Cl. 525-91.000.

Albany International Corp.: *See*—
Sokaris, Jerry G., 4,159,618, Cl. 57-251.000.

Albertson, Orris E.: *See*—
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Albiez, Ernst: *See*—
Bachmann, Hans; and Albiez, Ernst, 4,159,725, Cl. 140-93.200.

Alexander, Granison T., Jr., to Chromalloy American Corporation. Well bore cleaning tool. 4,159,742, Cl. 166-173.000.

Allan, John T., to Fiber Industries, Inc. Resilient polyester fibers. 4,159,617, Cl. 57-247.000.

Allen, Archelaius D. Self-advancing mine roof supports. 4,159,671, Cl. 91-32.000.

Allen & Hanburys Limited: *See*—
Bradshaw, John; and Collins, Ian, 4,160,036, Cl. 424-330.000.

Alles, David S.; and Hill, Joseph, to Bell Telephone Laboratories, Incorporated. Cassette unit and fixture for loading the unit with a planar member. 4,159,799, Cl. 235-486.000.

Allied Industries, Inc.: *See*—
Avery, Hugh E., Jr., 4,159,941, Cl. 209-3.000.

Allington, William B., deceased (by Emery, Richard T., executor); Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., to Instrumentation Specialties Company. Sample concentrator. 4,159,933, Cl. 204-180.00R.

Allis-Chalmers Corporation: *See*—
Knudson, Henry T.; and Klas, Kenneth H., 4,159,613, Cl. 56-11.300.
Leja, Ronald J.; and Williams, Hugh K., 4,159,835, Cl. 280-756.000.

Allport, Maurice J.; and Cotton, Herbert J. T., to Lucas Industries Limited. Rectifier and brush assembly for an alternator. 4,160,179, Cl. 310-68.00R.

Alper, Yekutiel: *See*—
Hood, Clarence E.; Webb, Byron K.; and Alper, Yekutiel, 4,159,745, Cl. 172-44.000.

Alto Corporation: *See*—
Weaver, John A., 4,159,662, Cl. 83-867.000.

Aluminum Company of America: *See*—
Hsieh, Hsiun P., 4,159,977, Cl. 260-40.00R.

Alza Corporation: *See*—
Ayer, Atul D.; and Theeuwes, Felix, 4,160,020, Cl. 424-15.000.

American Colloid Company: *See*—
Hughes, John; and Maul, Peter L., 4,159,683, Cl. 110-343.000.

American Home Products Corporation: *See*—
Immer, Hans U.; Nelson, Verner R.; and Gotz, Manfred K., 4,159,980, Cl. 260-112.5LH.
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,160,100, Cl. 560-43.000.

American Safety Equipment Corporation: *See*—
Rawson, Gerry, 4,159,809, Cl. 242-107.000.

American Science and Engineering, Inc.: *See*—
McCombs, Allan K.; and Stein, Jay A., 4,160,165, Cl. 250-354.000.

American Standard Inc.: *See*—
Tobin, Leo W., Jr., 4,159,550, Cl. 4-319.000.

AMF Incorporated: *See*—
Seiling, Samuel O., 4,159,740, Cl. 165-147.000.
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Amino Aluminium Industries, Co., Ltd.: *See*—
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Amino, Kunio, to Amino Aluminium Industries, Co., Ltd. Method for melting aluminum scraps. 4,159,907, Cl. 75-68.00R.

AMP Incorporated: *See*—
Schwalm, Glendon H., 4,159,565, Cl. 29-759.000.

Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., to International Business Machines Corporation. Method for fabrication vertical NPN and PNP structures utilizing ion-implantation. 4,159,915, Cl. 148-1.500.

Anderson, Charles H.; and Marlowe, Frank J., to RCA Corporation. System and method for keying video information to electron beam deflection. 4,160,194, Cl. 315-366.000.

Anderson, J. Hilbert, to Sea Solar Power. Plate-fin heat exchanger with controls therefor. 4,159,735, Cl. 165-40.000.

Anderson, Martin B.: *See*—
Steele, David J.; McLean, Andrew I. O.; and Anderson, Martin B., 4,160,155, Cl. 235-92.0TC.

Andersson, Gunnar; and Borgstrom, Gunnar, to ASEA Aktiebolag. Method for application of a tape of insulating material in the longitudinal direction of a substantially rectangular electrical conductor. 4,159,920, Cl. 156-54.000.

Andrews, Glenn C., to Pfizer Inc. Reduction of 2,5-diketogluconic acid. 4,159,990, Cl. 260-343.700.

Anhalt, John W., to International Telephone and Telegraph Corporation. Zero insertion force connector. 4,159,861, Cl. 339-75.0MP.

Anthes Equipment Limited: *See*—
Burrell, Michael P., 4,159,604, Cl. 52-376.000.

Antos, George J., to UOP Inc. Hydrocarbon conversion with an attenuated superactive multimetallic catalytic composite. 4,159,939, Cl. 208-139.000.

Aoki, Akio: *See*—
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, 4,159,890, Cl. 425-59.000.

Aoki, Eiichiro; and Suzuki, Tsutomu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with different types of tone forming systems. 4,159,663, Cl. 84-1.240.

Aoki, Kiyoshi, to Tokyo Shibaura Electric Co., Ltd. Logic circuit with two pairs of cross-coupled NAND/NOR gates. 4,160,173, Cl. 307-289.000.

Aquila S.p.A.: *See*—
Bussi, Giancarlo; and Baradel, Pierpaolo, 4,160,089, Cl. 544-78.000.

Arai, Nobuichi: *See*—
Tanaka, Tadashi; Obi, Tatsuro; Arai, Nobuichi; and Koyama, Teruo, 4,160,056, Cl. 428-220.000.

Arai, Tomiji, to Nissan Motor Company, Limited. Seat for a motor vehicle or the like. 4,159,847, Cl. 297-284.000.

Araki, Shigeyuki: *See*—
Imamura, Tomoatsu; Araki, Shigeyuki; Iwata, Nobuo; and Yoshimi, Masahiro, 4,160,200, Cl. 318-616.000.

Aramaki, Minoru: *See*—
Ono, Tetsuhiro; Aramaki, Minoru; Mizuno, Tamotsu; and Fujinaga, Masao, 4,160,012, Cl. 423-341.000.

ARBED - Acieries Reunies de Burbach-Eich-Dudelange S.A.: *See*—
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Rueggeberg, Werner, 4,160,145, Cl. 219-10.55F.

Armstrong, Harris W.: *See*—
Deffeyes, Robert J.; and Armstrong, Harris W., 4,160,284, Cl. 361-433.000.

Armstrong, Rolfe D., to NCR Corporation. One-bit multifunction arithmetic and logic circuit. 4,160,290, Cl. 364-716.000.

Arndt, Friedrich; and Nusslein, Ludwig, to Schering Aktiengesellschaft. 1,3,3-Trimethyl-6-azabicyclo-(3.2.1)-octane-6-carboxylic acid ester, herbicides, process for making same and composition containing same. 4,159,902, Cl. 71-95.000.

Arnone, Joseph A. Photographic retouching apparatus. 4,159,871, Cl. 354-350.000.

Artbauer, Jan, to Kabel-und Metallwerke Gutehoffnungshuette AG. High voltage electrical cables. 4,160,119, Cl. 174-28.000.

ASA S.A.: *See*—
Bru, Christian, 4,159,621, Cl. 57-338.000.

Asahi Glass Company, Ltd.: *See*—
Kozuka, Mikio; Ono, Isao; and Fukuwatari, Takashi, 4,160,003, Cl. 264-87.000.

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Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; and Tsuyama, Shigeo, 4,159,965, Cl. 252-429.00B.

Ascoli, Enzo, to Gillette Company, The. Vibratory electromagnetic motor. 4,160,177, Cl. 310-22.000.

ASEA Aktiebolag: *See*—
Andersson, Gunnar; and Borgstrom, Gunnar, 4,159,920, Cl. 156-54.000.

Asmus, David, Jr. Food dispensing bin. 4,159,955, Cl. 210-473.000.

Associated Mills, Inc.: *See*—
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Atlantic Richfield Company: *See*—
Hix, Larry J.; Wise, Phillip W.; and Bennyhoff, David H., 4,160,228, Cl. 340-7.00R.
Smith, Robert H., 4,159,940, Cl. 208-254.00H.

Atoji, Hitomi; Kunisawa, Masuo; Shimooka, Riyo; and Okazaki, Seiji, to Dainippon Screen Seizo Kabushiki Kaisha. Picture scanner with a scanning light position detector. 4,160,280, Cl. 358-294.000.

Attwood, Brian W.: *See*—
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Avco Corporation: *See*—
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Avery, Hugh E., Jr., to Allied Industries, Inc. Separator. 4,159,941, Cl. 209-3.000.

Avon Products, Inc.: *See*—
Bulwith, Joseph P., 4,159,762, Cl. 198-472.000.

Ayer, Atul D.; and Theeuwes, Felix, to Alza Corporation. Therapeutic device for osmotically dosing at controlled rate. 4,160,020, Cl. 424-15.000.

B. F. Goodrich Company, The: *See*—
Kroenke, William J.; Carroll, Richard T.; and Magistro, Angelo J., 4,159,968, Cl. 252-462.000.

Baatrup, Johannes V.; and Rasmussen, Ivar, to Danfoss A/S. Control device for steering apparatus or the like. 4,159,723, Cl. 137-596.130.

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Bachmann, Hans; and Albiez, Ernst, to Borbe-Wanner AG. Apparatus for tensioning and locking hooping bands. 4,159,725, Cl. 140-93.200.

Badger, Algernon S.: *See*—
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Badger Company, Inc., The: *See*—
Miserlis, Constantine D., 4,159,992, Cl. 260-412.600.

Bailey, Vincent R. Dispensing container. 4,159,790, Cl. 222-211.000.

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Barger, William R.: *See*—
Garrett, William D.; and Barger, William R., 4,160,033, Cl. 424-285.000.

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Barnes, Vera L.; Dodds, Thomas J., Jr.; Gibson, Harold F.; and Campbell, Carl M., Jr., to Burroughs Corporation. Link encryption device. 4,160,120, Cl. 178-22.000.

Barquist, William S., Jr.; and Hutcheon, Robert S., to Raytheon Company. Radio frequency receiver having serially coupled heterodyning stages, each stage having filters with difference center frequencies. 4,160,212, Cl. 325-432.000.

Barrett Battery, Inc.: *See*—
Parker, John R., 4,160,071, Cl. 429-211.000.

Bartlow, David H.; and Sommerkamp, Robert M., to Owens-Corning Fiberglas Corporation. Glass fiber reinforced thermosetting resin tank for processing olives. 4,159,781, Cl. 220-5.00A.

BASF Aktiengesellschaft: *See*—
Cary, Paul D., 4,159,812, Cl. 242-192.000.

Baskas, Morris J.; and Berger, Sidney I., to Dentipressions Incorporated. Disposable mixing syringe. 4,159,570, Cl. 32-66.000.

Battelle-Institute e. V.: *See*—
Achatz, Manfred; Beck, Rasmus; and Bockelmann, Werner, 4,159,867, Cl. 351-6.000.

Bauer, Werner R.; and Smith, William N., to Robertshaw Controls Company. Electrical switch construction and method of making the same. 4,159,563, Cl. 29-622.000.

Bauman, Albert J., to California Institute of Technology. Enhancement of polyisoprene latex production. 4,159,903, Cl. 71-98.000.

Bayer Aktiengesellschaft: *See*—
Koenig, Kalus; Reichmann, Wolfgang; and Pedain, Josef, 4,160,080, Cl. 528-59.000.
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,160,098, Cl. 548-374.000.
Schreyer, Gerd; Wirthwein, Rolf; Reissinger, Karl-Hermann; and Krekel, Jorg, 4,159,925, Cl. 203-28.000.

Baylor College of Medicine: *See*—
Lamb, Raymond K.; and Walker, Stephen J., 4,159,637, Cl. 73-46.000.

BBC Brown Boveri & Company Limited: *See*—
Liptak, Gabor; and Schuler, Roland, 4,159,562, Cl. 29-596.000.

Beck, Harold, to Tissue Products Co., Inc. Treated pad dispensing device. 4,159,772, Cl. 206-820.000.

Beck, Rasmus: *See*—
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Beckman Instruments, Inc.: *See*—
Pierre, Kenneth J.; Tung, Ker-Kong; and Nadj, Henriette, 4,159,923, Cl. 435-15.000.

Becton, Dickinson and Company: *See*—
Prais, Alois G., 4,159,713, Cl. 128-765.000.

Bedue, Abel J. H.: *See*—
Denis, Louis H. D.; Bedue, Abel J. H.; and Malherbaud, Jacques, 4,159,736, Cl. 165-104.00S.

Beecham Group Limited: *See*—
Burton, George; and Watson, Elzbieta, 4,160,086, Cl. 544-26.000.

Beestman, George B.; and Prill, Erhard J., to Monsanto Company. Corrosion inhibited agricultural compositions. 4,159,901, Cl. 71-86.000.

Begany, Albert J.: *See*—
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,160,100, Cl. 560-43.000.

Bell Telephone Laboratories, Incorporated: *See*—
Alles, David S.; and Hill, Joseph, 4,159,799, Cl. 235-486.000.
Casey, Horace C., Jr.; Cho, Alfred Y.; and Nicollian, Edward H., 4,160,261, Cl. 357-23.000.
Dawson, Larry R.; and Knight, Stephen, 4,160,258, Cl. 357-16.000.
De Salvo, Francis J., Jr.; and Murphy, Donald W., 4,159,962, Cl. 252-182.100.
McFee, James H.; and Miller, Barry I., 4,159,919, Cl. 148-175.000.
Slana, Matthew F.; and Vaughan, Henry E., deceased, 4,160,127, Cl. 179-15.0AQ.

Belmonte, Carl; Dakss, Mark L.; and Fulenwider, John E., to GTE Laboratories Incorporated. Hand-held tool for optical fiber waveguide end preparation. 4,159,793, Cl. 225-96.500.

Bender, Peter: *See*—
Luther, Hans-Werner; and Bender, Peter, 4,159,678, Cl. 102-44.000.

Bendix Corporation, The: *See*—
Mayer, Endre A., 4,159,703, Cl. 123-139.0AW.

Sweet, Charles R., 4,159,697, Cl. 123-32.0EH.

Benisek, Ladislav, to I.W.S. Nominee Company Limited. Zirconium flame-resist treatment. 4,160,051, Cl. 427-352.000.

Bennyhoff, David H.: *See*—
Hix, Larry J.; Wise, Phillip W.; and Bennyhoff, David H., 4,160,228, Cl. 340-7.00R.

Berecz, Imre, to Microdot Inc. Method of manufacturing a barrel nut. 4,159,552, Cl. 10-86.00F.

Berenbaum, Marvin, to Las Vegas Research, Inc. Anti-pollution method and apparatus for combustion engines. 4,159,698, Cl. 123-41.310.

Berendonk, Bengt: *See*—
Bojarski, Victor, 4,160,206, Cl. 324-73.00R.

Berger, Sidney I.: *See*—
Baskas, Morris J.; and Berger, Sidney I., 4,159,570, Cl. 32-66.000.

Bergkvist, Lars A. Device for indicating a horizontal direction and one or more angle sectors about said direction. 4,159,577, Cl. 33-366.000.

Bergwerksverband GmbH: *See*—
Peters, Werner; Langhoff, Josef; Henkel, Siegfried; and Haverkamp, Klaus D., 4,159,905, Cl. 75-42.000.

Berlyn Corporation, The: *See*—
Paquette, James P., 4,159,953, Cl. 210-396.000.

Bernard, Walter J.; and Randall, John J., Jr., to Sprague Electric Company. Anodizing aluminum in boric acid bath containing hydroxy organic acid. 4,159,927, Cl. 204-58.000.

Berner, Howard E., to Pharmacaps, Inc. Capsule box. 4,159,568, Cl. 30-124.000.

Bernham, Robert R.: *See*—
Christy, Harold; and Bernham, Robert R., 4,160,263, Cl. 358-1.000.

Berry, William M., Jr., to UOP Inc. Method for loading particulate matter in a vessel. 4,159,785, Cl. 222-63.000.

Betts, David A.: *See*—
Karbo, Donald J.; Betts, David A.; and Pauer, Lyle A., 4,160,234, Cl. 340-58.000.

Beutler, Paul S.: *See*—
Johnson, Owen W.; Miller, Gerald R.; and Beutler, Paul S., 4,160,069, Cl. 429-104.000.

Beyerle, Willi. Retaining device for plug-in unit coacting with a contact carrier. 4,159,770, Cl. 206-577.000.

Bhatia, Harsaran S.: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., 4,159,915, Cl. 148-1.500.

Biddle, Nicholas, III; and Patterson, Roger A., to Du Pont de Nemours, E. I., and Company. Periodically excited level control probe. 4,159,786, Cl. 222-64.000.

Biermann, Udo K. P.; van der Sluys, Willem L. N.; and Roelofs, Johannes C. M., to U.S. Philips Corporation. Heat pipe. 4,159,737, Cl. 165-105.000.

Bimbi, Giuseppe: *See*—
Agnes, Giovanni; Bimbi, Giuseppe; Guerrieri, Franco; and Rucci, Guglielmo, 4,160,107, Cl. 560-204.000.

Bingham, Elena M.; and Elliott, Arthur J., to Du Pont de Nemours, E. I., and Company. Quinazolinone oxides and their use as intermediates for pharmaceutical agents. 4,160,092, Cl. 544-286.000.

Birchall, James D.; and Pybus, Roger M., to Imperial Chemical Industries Limited. Siliceous materials. 4,159,913, Cl. 106-307.000.

Birker, Bertel: *See*—
Paulsen, Mogens T.; and Birker, Bertel, 4,159,646, Cl. 73-194.00A.
Paulsen, Mogens T.; and Birker, Bertel, 4,159,647, Cl. 73-194.00A.

Bjorklund, Knut B. Stabilized cancer associated polypeptide antigen and preparation thereof. 4,160,018, Cl. 424-12.000.

Bjorklund, Knut B. Detection of cancer associated polypeptide antigen and preparation of antibodies thereto. 4,160,019, Cl. 424-12.000.

Black, William J.; Richardson, Warner G.; and Wilson, Eugene M., to Caterpillar Tractor Co. Elevating scraper up-stop mechanism. 4,159,583, Cl. 37-8.000.

Blankenship, Ernest B., to Research Products/Blankenship Corporation. Incinerator urinal. 4,159,547, Cl. 4-111.100.

Blum, Julian J. Multilayered labeling system. 4,159,586, Cl. 40-2.00R.

Blumenaus, Jon M., to World Carpets, Inc. Method of print dyeing textile materials from a photograph and products made therefrom. 4,159,892, Cl. 8-62.000.

BNF Metals Technology Centre: *See*—
Barnes, Clive; and Ward, John J. B., 4,159,926, Cl. 204-49.000.

Boche, Paul H. Cruise control device for vehicles. 4,159,753, Cl. 180-177.000.

Bockelmann, Werner: *See*—
Achatz, Manfred; Beck, Rasmus; and Bockelmann, Werner, 4,159,867, Cl. 351-6.000.

Bodor, Nicolae S., to Interx Research Corporation. Labile, non-heterocyclic quaternary ammonium salt/esters as transient derivatives. 4,160,099, Cl. 560-110.000.

Boeing Company, The: *See*—
Farris, William E., 4,159,690, Cl. 114-275.000.
Hu, John C., 4,159,894, Cl. 23-230.0PC.

Bojanek, Robert J.; and Mason, Marvin S., to GTE Sylvania Incorporated. Modular multiplex/demultiplex apparatus. 4,160,126, Cl. 179-15.0AT.

Bojarski, Victor, to Berendonk, Bengt. Audible voltage-impedance tester. 4,160,206, Cl. 324-73.00R.

Borbe-Wanner AG.: *See*—
Bachmann, Hans; and Albiez, Ernst, 4,159,725, Cl. 140-93.200.

Borchers, Clinton H. Method of compressing and realigning bone structures to correct splay foot. 4,159,716, Cl. 128-80.00R.

Borgstrom, Gunnar: *See*—
Andersson, Gunnar; and Borgstrom, Gunnar, 4,159,920, Cl. 156-54.000.

Boushek, Sidney J., Jr., to Deere & Company. Harvesting machine frame. 4,159,749, Cl. 180-305.000.

Bower, David S.; and Smith, Fred J., to Digital Products Corporation. Telephone polling apparatus. 4,160,125, Cl. 179-6.00D.

Bower, Earle S. Disposable douche. 4,159,718, Cl. 128-248.000.

Bowman, Peter: *See*—
Chen, Evan N.; and Bowman, Peter, 4,159,567, Cl. 30-62.000.

Bradshaw, John; and Collins, Ian, to Allen & Hanburys Limited. 4-Hydroxy-1,3-benzenedimethanol derivatives. 4,160,036, Cl. 424-330.000.

Braithwaite, Arthur B. M., to Caterpillar Tractor Co. Method for making a boom. 4,159,796, Cl. 228-151.000.

Branson, Charles D.; and Demi, Roy C., to Robertshaw Controls Company. Fuel control system and control device therefor or the like. 4,159,800, Cl. 236-15.00A.

Braslaw, Jacob; and Pai, Purnachandra, to Ford Motor Company. Dissolution of polyurethane foams and re-use of the products therefrom. 4,159,972, Cl. 260-2.300.

Bratsberg, Glenn N. Airstream deflector for motor vehicles. 4,159,845, Cl. 296-95.00R.

Bridgeport Machines Division of Textron Inc.: *See*—
Parkinson, Edward J., 4,159,658, Cl. 74-813.00L.

Briles, Franklin S. Expanding head riveting method and system. 4,159,666, Cl. 85-37.000.

Broad, Roy M., to Scott & Fetzer Company, The. High voltage cable coupler with termination adaptor. 4,159,860, Cl. 339-60.00M.

Bromer, Gunter, to Siemens Aktiengesellschaft. Numerically-controlled machine tool. 4,160,198, Cl. 318-565.000.

Bronn, Walter K.: *See*—
Luca, Sebastiano F.; Thommel, Jurgen; and Bronn, Walter K., 4,160,040, Cl. 426-62.000.

Brooks, John L.; Budziarek, Richard; and Harper, David J., to Imperial Chemical Industries Limited. Process of crosslinking unsaturated hydrocarbon polymers employing novel carbamates. 4,160,077, Cl. 525-332.000.

Brooks, Larry L.; and McMillon, David A. Dewatering system. 4,159,947, Cl. 210-108.000.

Brothers, Warren S.; and Kallfelz, Albert J., to Carrier Corporation. Heat transfer surface and method of manufacture. 4,159,739, Cl. 165-133.000.

Brown, Harry W., to Cutler-Hammer, Inc. Switch with indexing detent block. 4,160,138, Cl. 200-67.00A.

Brown, Robert E.; Johnson, David L.; and Lindquist, John F., to Caterpillar Tractor Co. Adapter for preloading bearings. 4,159,750, Cl. 180-9.620.

Brown, Stanley L., to Roscoe Brown Corporation. Rotary trencher and shoe assembly therefor. 4,159,585, Cl. 37-97.000.

Bru, Christian, to ASA S.A. Friction disc for false twisting. 4,159,621, Cl. 57-338.000.

Bruggemann & Brand KG: *See*—
Fengels, Gerd, 4,159,840, Cl. 294-77.000.

Brugger, Max: *See*—
Rittel, Werner; Brugger, Max; Kamber, Bruno; Riniker, Bernhard; Sieber, Peter; and Greven, Hendrik M., 4,159,981, Cl. 260-112.50T.

Brumleu, Edward C., Jr. Universal diffuser assembly and method of manufacturing. 4,159,674, Cl. 98-40.00R.

Bryer, Jack; Padalino, Dominick; and Polglase, Burton C., to Wood Industries, Inc. Multiple product folder. 4,159,823, Cl. 270-21.000.

Buckley, James E.; McKendrick, Thomas E.; North, Lee E.; and Mendelsohn, Nathan, to Ex-Cell-O Corporation. Biaxial turning machine with means for bidirectional independent tool compensation. 4,159,660, Cl. 82-3.000.

Budziarek, Richard: *See*—
Brooks, John L.; Budziarek, Richard; and Harper, David J., 4,160,077, Cl. 525-332.000.

Budzich, Tadeusz. Load responsive control valve. 4,159,724, Cl. 137-596.130.

Bulwith, Joseph P., to Avon Products, Inc. Article transferring apparatus. 4,159,762, Cl. 198-472.000.

Bunker Ramo Corporation: *See*—
Jennings, Richard A., 4,160,154, Cl. 235-92.0EA.
Johnston, Samuel A., 4,160,139, Cl. 200-83.00N.

Burgdorf, Jochen: *See*—
Oberthuer, Heinrich; Burgdorf, Jochen; and Luepertz, Hans-Henning, 4,159,853, Cl. 303-6.00C.

Burr, John F.: *See*—
Dolinar, Kevin D.; and Burr, John F., 4,160,282, Cl. 361-31.000.

Burrell, Michael P., to Anthes Equipment Limited. Joist. 4,159,604, Cl. 52-376.000.

Burroughs Corporation: *See*—
Barnes, Vera L.; Dodds, Thomas J., Jr.; Gibson, Harold F.; and Campbell, Carl M., Jr., 4,160,120, Cl. 178-22.000.

Burton, Andrew F. Infusion of liquids into tissue. 4,159,720, Cl. 128-260.000.

Burton, George; and Watson, Elzbieta, to Beecham Group Limited. 3-Heterocyclicthio-7-α-carboxy 2-aryl acetamido cephalosporanic acid. 4,160,086, Cl. 544-26.000.

Buschman, Bob D.: *See*—
Kaul, Pradeep P.; Scholl, Thomas H.; Muzundar, Deepak R.; Wendling, Daniel R.; Buschman, Bob D.; Ikawa, Michio; Miura, Akira; and Love, David A., 4,160,131, Cl. 179-99.00M.

Bussi, Giancarlo; and Baradel, Pierpaolo, to Aquila S.p.A. Utilization of orthophosphoric esters for the production of aqueous fluids for working metals. 4,160,089, Cl. 544-78.000.
Butler Automatic, Inc.: *See*—
Meihofer, Edward F., 4,159,808, Cl. 242-75.510.
Butler, Walker; and Moore, Randolph G., to Motorola, Inc. Active radar missile launch envelope computation system. 4,160,250, Cl. 343-9.00R.
Butterwick, Gilbert N., to United States of America, Navy. Electron beam tube. 4,160,188, Cl. 313-446.000.
Bynum, Douglas, Jr., to Continental Oil Company. Platform safety barrier. 4,160,060, Cl. 428-310.000.
C.G.R.-Mev: *See*—
Tran, Duc Tien; and Tronc, Dominique, 4,160,189, Cl. 315-5.410.
C. H. Symington & Co., Inc.: *See*—
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Cadillac Gage Company: *See*—
Jackson, Theodore A.; and Crabtree, James D., 4,159,669, Cl. 89-36.00L.
California Institute of Technology: *See*—
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Calkins, John A.: *See*—
Jesme, Philip O.; and Calkins, John A., 4,159,767, Cl. 206-343.000.
Calnek, Bruce W.: *See*—
Schat, Karel A.; and Calnek, Bruce W., 4,160,024, Cl. 424-89.000.
Calvert, Rodney K., to Mead Corporation, The. Bottle carrier. 4,159,841, Cl. 294-87.200.
Camara, Elias H.; Marianowski, Leonard G.; and Donado, Rafael A., to Institute of Gas Technology. Molten carbonate fuel cell corrosion inhibition. 4,160,067, Cl. 429-16.000.
Camco, Incorporated: *See*—
Watkins, Fred E., 4,159,643, Cl. 73-155.000.
Cameto, Leon R.; and Edmund, John R., to MistO_2Gen Equipment Company. Chamber for ultrasonic aerosol generation. 4,159,803, Cl. 239-102.000.
Campbell, Carl M., Jr.: *See*—
Barnes, Vera L.; Dodds, Thomas J., Jr.; Gibson, Harold F.; and Campbell, Carl M., Jr., 4,160,120, Cl. 178-22.000.
Campbell, Richard A. Radiation shadow indicator. 4,159,576, Cl. 33-281.000.
Campbell Soup Company: *See*—
Egee, Walter W.; and Cramer, Clarence W., 4,159,761, Cl. 198-422.000.
Campbell, Willis R.: *See*—
Eggers, Edward T.; Waldrop, Thomas W.; Sheesley, Donald L.; and Campbell, Willis R., 4,159,615, Cl. 56-341.000.
Canadian Patents and Development Limited: *See*—
Kashyap, Satish C.; and Wysiouzil, Walter, 4,160,144, Cl. 219-10.55A.
Canon Kabushiki Kaisha: *See*—
Kawamura, Naoto; and Tajima, Akira, 4,159,865, Cl. 350-184.000.
Carl Still Recklinghausen, Firma: *See*—
Lemke, Otto; and Krause, Manfred, 4,159,924, Cl. 202-142.000.
Carlo Erba S.p.A.: *See*—
Doria, Gianfederico; Romeo, Ciriaco; Corno, Maria L.; Lauria, Francesco; Sberze, Piero; and Tibolla, Marcellino, 4,160,028, Cl. 424-248.510.
Carlo, James T.: *See*—
Stephenson, Alvis D., Jr.; and Carlo, James T., 4,160,274, Cl. 365-2.000.
Carnahan, James C., Jr., to General Electric Company. Method for stabilizing bisphenols under melt or distillation conditions. 4,160,110, Cl. 568-703.000.
Carpentier, Alain. Heart valve prosthesis. 4,159,543, Cl. 3-1.500.
Carrier Corporation: *See*—
Brothers, Warren S.; and Kallfelz, Albert J., 4,159,739, Cl. 165-133.000.
Carrish, Jeffrey J., to Dennison Manufacturing Company. Three electrode system in the generation of electrostatic images. 4,160,257, Cl. 346-159.000.
Carroll, James C., to International Telephone and Telegraph Corporation. Digital signal level measurement. 4,160,134, Cl. 179-175.30R.
Carroll, Richard T.: *See*—
Kroenke, William J.; Carroll, Richard T.; and Magistro, Angelo J., 4,159,968, Cl. 252-462.000.
Carter, George W., to RCA Corporation. Mixer injection voltage compensation circuit. 4,160,213, Cl. 325-439.000.
Cary, Paul D., to BASF Aktiengesellschaft. Apparatus for loading a tape cassette. 4,159,812, Cl. 242-192.000.
Casey, Horace C., Jr.; Cho, Alfred Y.; and Nicollian, Edward H., to Bell Telephone Laboratories, Incorporated. MIS Heterojunction structures. 4,160,261, Cl. 357-23.000.
Cassano, James R.: *See*—
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Caterpillar Tractor Co.: *See*—
Black, William J.; Richardson, Warner G.; and Wilson, Eugene M., 4,159,583, Cl. 37-8.000.
Braithwaite, Arthur B. M., 4,159,796, Cl. 228-151.000.
Brown, Robert E.; Johnson, David L.; and Lindquist, John F., 4,159,750, Cl. 180-9.620.
Garman, James A., 4,159,751, Cl. 180-22.000.
Maguire, Roy L., 4,159,650, Cl. 73-847.000.
Peterson, Wayne A., 4,159,854, Cl. 303-6.00M.
Purcell, Robert J., 4,159,857, Cl. 305-54.000.
Cecil, James B.: *See*—
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Celanese Corporation: *See*—
Stautzenberger, Adin L.; Paul, James L.; and Unruh, Jerry D., 4,159,999, Cl. 260-604.0HF.
Centerline Steering Safety Axle Corporation, The: *See*—
Inbody, Melvin R., 4,159,832, Cl. 280-96.300.
Central Glass Company, Limited: *See*—
Okino, Seiki; Mori, Takao; Yanai, Toshiharu; and Sawa, Toshikazu, 4,160,061, Cl. 428-334.000.
Ono, Tetsuhiro; Aramaki, Minoru; Mizuno, Tamotsu; and Fujinaga, Masao, 4,160,012, Cl. 423-341.000.
Ceprini, Mario Q.: *See*—
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Champion International Corporation: *See*—
Roccaforte, Harry I., 4,159,765, Cl. 206-45.190.
Charles Machine Works, Inc., The: *See*—
Schuermann, Kenneth W., 4,159,630, Cl. 405-174.000.
Chemie Linz Aktiengesellschaft: *See*—
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Chen, Evan N.; and Bowman, Peter, to Warner-Lambert Company. Shaving instrument. 4,159,567, Cl. 30-62.000.
Chen, Tung C., to Systematics Inc. Circuit for controlling demands of high current load. 4,160,172, Cl. 307-252.00M.
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Colin, Lucien; and Chesnel, Andre, 4,160,214, Cl. 328-65.000.
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Adamson, John S., 4,160,239, Cl. 340-152.00T.
de Vries, Louis, 4,159,956, Cl. 252-33.400.
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Chillier-Duchatel, Nicole; and Verger, Bernard, to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie". Electrolyzer power supply. 4,160,287, Cl. 363-13.000.
Cho, Alfred Y.: *See*—
Casey, Horace C., Jr.; Cho, Alfred Y.; and Nicollian, Edward H., 4,160,261, Cl. 357-23.000.
Choi, Won: *See*—
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Christensen, John M.: *See*—
Curry, Harold G.; Attwood, Brian W.; White, Derek G. W.; Christensen, John M.; and Kroyer, Karl K. K., 4,160,004, Cl. 264-120.000.
Christiansen, Robert G., to Sterling Drug Inc. Steroid cyanoketones and intermediates. 4,160,027, Cl. 424-241.000.
Christy, Harold; and Bernham, Robert R., to Cogar, George R. Dual or multiple objective video microscope for superimposing spaced images. 4,160,263, Cl. 358-1.000.
Chromalloy American Corporation: *See*—
Alexander, Granison T., Jr., 4,159,742, Cl. 166-173.000.
Chung, Tae H.: *See*—
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Ciba-Geigy Corporation: *See*—
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Ciba Geigy (UK) Limited: *See*—
Smith, Malcolm J.; Miles, Peter; Richardson, Norman; and Finan, Michael A., 4,159,946, Cl. 210-58.000.
Citizen Watch Co., Ltd.: *See*—
Shimizu, Shotaro; and Fujikawa, Toyoharu, 4,160,241, Cl. 340-763.000.
Clark Equipment Company: *See*—
Stilley, Herschel H., 4,159,657, Cl. 74-801.000.
Claudon, Jacques: *See*—
Sroussi, Roland; Nicolas, Jean; and Claudon, Jacques, 4,159,961, Cl. 252-63.200.
Clausing, Charles I., to Gould Inc. Circuit breaker main and disconnect contact structure. 4,160,142, Cl. 200-254.000.
Clayton, William J., to Mobil Oil Corporation. Blocked film laminate of low density polyethylene. 4,160,053, Cl. 428-35.000.
Clemence, Francois; and Le Martret, Odile, to Roussel Uclaf. Novel thiophene-acetic acids. 4,159,986, Cl. 260-332.20A.
Clement, Ralph C.; and Latimer, William R., to Gould Inc. Bracket means to mount a padlock for blocking movement of a switch handle. 4,160,137, Cl. 200-42.00T.
Clemson University: *See*—
Hood, Clarence E.; Webb, Byron K.; and Alper, Yekutiel, 4,159,745, Cl. 172-44.000.
Cluzel, Philippe H., to Etat Francais. Acoustic antenna. 4,160,230, Cl. 340-9.000.
Coca-Cola Company, The: *See*—
Schorr, Frederick D., 4,159,831, Cl. 280-79.300.
Cogar, George R.: *See*—
Christy, Harold; and Bernham, Robert R., 4,160,263, Cl. 358-1.000.

Cohen, Choua; and Sillion, Bernard, to Institut Francais du Petrole. Alkyl-guanidino-heterocyclic compounds, their manufacture and use as additives for fuels and lubricants. 4,159,898, Cl. 44-63.000.

Cole, Lucille J., to Merck & Co., Inc. Process for the separation of antibiotic macrolides. 4,160,083, Cl. 536-17.00A.

Colgate Palmolive Company: *See—*
Delaney, Thomas J.; and Pierson, William G., 4,160,022, Cl. 424-52.000.

Colin, Lucien; and Chesnel, Andre, to Thomson-CSF. Modular modulator for radar transmitters. 4,160,214, Cl. 328-65.000.

Collins, Ian: *See—*
Bradshaw, John; and Collins, Ian, 4,160,036, Cl. 424-330.000.

Commissariat a l'Energie Atomique: *See—*
Dalle, Jean L.; Dumont, Maurice; Fourcy, Andre; Freychet, Aime; and Gouzy, Andre, 4,159,595, Cl. 47-2.000.

Communications Satellite Corp.: *See—*
Stuart, Kenneth L.; and Baker, William E., Jr., 4,160,288, Cl. 363-41.000.

Compaan, Klaas: *See—*
Kramer, Pieter; Compaan, Klaas; and Forsthuber, Robert F. K., 4,160,269, Cl. 358-128.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel S.A.: *See—*
Eldin, Jacques, 4,159,900, Cl. 65-4.00B.

Conant, John P.: *See—*
Sanders, Royden C., Jr.; Lerer, Michael I.; and Conant, John P., 4,159,882, Cl. 400-124.000.

Concept Fiberglass Homes, Inc.: *See—*
Schroeder, Leonard F., 4,159,603, Cl. 52-82.000.

Consolidation Coal Company: *See—*
Dolinar, Kevin D.; and Burr, John F., 4,160,282, Cl. 361-31.000.

Continental Oil Company: *See—*
Bynum, Douglas, Jr., 4,160,060, Cl. 428-310.000.

Contraves AG: *See—*
Eicher, Walter, 4,160,267, Cl. 358-126.000.

Control Switchboards Pty, Ltd.: *See—*
Hodkinson, Trevor, 4,159,810, Cl. 242-198.000.

Cooper, Frank W., Jr., to Westinghouse Electric Corp. Mandrel for hydraulically expanding a tube into engagement with a tubesheet. 4,159,564, Cl. 29-727.000.

Cordry, Arthur L.: *See—*
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., 4,159,933, Cl. 204-180.00R.

Corey, George P.; and Haas, Paul, Jr., to Eastman Kodak Company. Exposure control apparatus including general purpose lag compensation. 4,159,870, Cl. 354-32.000.

Cornell Research Foundation, Inc.: *See—*
Schat, Karel A.; and Calnek, Bruce W., 4,160,024, Cl. 424-89.000.

Corno, Maria L.: *See—*
Doria, Gianfederico; Romeo, Ciriaco; Corno, Maria L.; Lauria, Francesco; Sberze, Piero; and Tibolla, Marcellino, 4,160,028, Cl. 424-248.510.

Cosper, David R., to Nalco Chemical Company. Accelerated process for causticization of Kraft green liquor. 4,159,922, Cl. 162-30.00K.

Cossey, Mike R., to Under Sea Industries, Inc. Antiset protector for second stage scuba regulators. 4,159,717, Cl. 128-142.200.

Cotonificio Cantoni S.p.A.: *See—*
Durville, Gerard; Moulin, Michel; Ramseier, Serge; and Zurcher, Erwin, 4,159,558, Cl. 26-10.00R.

Cotton, Herbert J. T.: *See—*
Allport, Maurice J.; and Cotton, Herbert J. T., 4,160,179, Cl. 310-68.00R.

Coucher, Robert G., to Pioneer Associates 2. Bread making machine. 4,159,879, Cl. 366-98.000.

Coulter Electronics, Inc.: *See—*
Shine, Ian B., 4,159,895, Cl. 23-230.00B.

Courson, Iber C., to Westinghouse Electric Corp. Transportation apparatus. 4,159,758, Cl. 198-335.000.

Crabtree, James D.: *See—*
Jackson, Theodore A.; and Crabtree, James D., 4,159,669, Cl. 89-36.00L.

Crafco, Inc.: *See—*
Jacobson, Carl C.; Manning, Mark C.; and Hill, Francis K., 4,159,877, Cl. 366-22.000.

Cramer, Clarence W.: *See—*
Egee, Walter W.; and Cramer, Clarence W., 4,159,761, Cl. 198-422.000.

Crasnianski, Serge, to Kis-France. Selector-dispenser of flat key blanks. 4,159,783, Cl. 221-13.000.

CRC Compagnia di Ricerca Cimica S.A.: *See—*
Kajfez, Franjo; Sunjic, Vitomir; and Sunjic, Vesna, 4,160,096, Cl. 548-338.000.

Crompton & Knowles Corporation: *See—*
Hoddinott, David C.; and Jette, Edwin L., Jr., 4,159,579, Cl. 34-155.000.

Crossley, Roger: *See—*
Curran, Adrian C. W.; Crossley, Roger; and Hill, David G., 4,160,094, Cl. 546-152.000.

Crossman, Milton R. Pickup truck air deflector. 4,159,843, Cl. 296-1.00S.

Crowe, William D., to J. R. Schneider Co. Beltless vacuum filter. 4,159,948, Cl. 210-111.000.

Crutcher, William C. Measuring and dispensing device. 4,159,791, Cl. 222-454.000.

Cruz, Maria I.: *See—*
Seto, Herbert; Cruz, Maria I.; and Fripiat, Jose J., 4,159,994, Cl. 260-448.00C.

Curran, Adrian C. W.; Crossley, Roger; and Hill, David G., to John Wyeth & Brother Limited. Tetrahydroquinoline derivatives. 4,160,094, Cl. 546-152.000.

Curry, Harold G.; Attwood, Brian W.; White, Derek G. W.; Christensen, John M.; and Kroyer, Karl K. K., to Karl Kroyer St. Anne's Limited. Production of fibrous sheet material. 4,160,004, Cl. 264-120.000.

Cushing, Vincent J., to Monitek, Inc. Electromagnetic fluid flow meter with tolerance to spurious signals. 4,159,645, Cl. 73-194.0EM.

Cutler-Hammer, Inc.: *See—*
Brown, Harry W., 4,160,138, Cl. 200-67.00A.

Cycle-Drive Corporation: *See—*
Trammell, Earl M., Jr., 4,159,652, Cl. 74-117.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Komatsu, Kenji; and Wakamatsu, Teruyoshi, 4,159,771, Cl. 206-620.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Atoji, Hitomi; Kunisawa, Masuo; Shimooka, Riyo; and Okazaki, Seiji, 4,160,280, Cl. 358-294.000.

Dakss, Mark L.: *See—*
Belmonte, Carl; Dakss, Mark L.; and Fulenwider, John E., 4,159,793, Cl. 225-96.500.

Dalbert, Johannes: *See—*
Pittasch, Willi; and Dalbert, Johannes, 4,159,557, Cl. 16-129.000.

Dalle, Jean L.; Dumont, Maurice; Fourcy, Andre; Freychet, Aime; and Gouzy, Andre, to Commissariat a l'Energie Atomique. Installation for cultivating plants. 4,159,595, Cl. 47-2.000.

Danfoss A/S: *See—*
Baatrup, Johannes V.; and Rasmussen, Ivar, 4,159,723, Cl. 137-596.130.
Paulsen, Mogens T.; and Birker, Bertel, 4,159,646, Cl. 73-194.00A.
Paulsen, Mogens T.; and Birker, Bertel, 4,159,647, Cl. 73-194.00A.

Daravingas, George V.: *See—*
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,160,054, Cl. 424-48.000.

Darms, Roland: *See—*
Kvita, Vratislav; Darms, Roland; and Greber, Gerd, 4,160,081, Cl. 528-93.000.

Data Motion Incorporated: *See—*
Seitz, Alan F., 4,159,794, Cl. 226-75.000.

d'Autry, Eric M. Device for dispensing adjustable volumes of a liquid. 4,159,784, Cl. 222-32.000.

Davies, George E.; and Foulkes, David M., to Imperial Chemical Industries Limited. Herbicidal compositions. 4,160,017, Cl. 424-10.000.

Davis, Steven S., to Envirotech Corporation. Sector assembly. 4,159,951, Cl. 210-331.000.

Dawson, Larry R.; and Knight, Stephen, to Bell Telephone Laboratories, Incorporated. Optically coupled linear bilateral transistor. 4,160,258, Cl. 357-16.000.

Dawson, Robert H.: *See—*
Marlowe, Frank J.; and Dawson, Robert H., 4,160,273, Cl. 364-900.000.

De luxe General, Incorporated: *See—*
Degenkolb, David J.; and Scobey, Fred J., 4,159,930, Cl. 204-111.000.

Dearth, Leonard R.; and Lodzinski, Fred P., to Nekoosa Papers Inc. Optical property measurement system and method. 4,159,874, Cl. 356-73.000.

Deere & Company: *See—*
Boushek, Sidney J., Jr., 4,159,749, Cl. 180-305.000.

Deffeyes, Robert J.; and Armstrong, Harris W., to Graham Magnetics, Inc. Capacitors and process for making same. 4,160,284, Cl. 361-433.000.

Degenkolb, David J.; and Scobey, Fred J., to De luxe General, Incorporated. Process for recovering heavy metal ions from dilute aqueous solution. 4,159,930, Cl. 204-111.000.

Delaney, Thomas J.; and Pierson, William G., to Colgate Palmolive Company. Toothpaste. 4,160,022, Cl. 424-52.000.

Delavarenne, Serve Y.: *See—*
Dubreux, Bernard; Delavarenne, Serve Y.; and Schirmann, Jean-Pierre, 4,159,991, Cl. 260-401.000.

Demarest, LeRoy E.: *See—*
Kewley, Monte L.; and Demarest, LeRoy E., 4,159,763, Cl. 198-853.000.

Demi, Roy C.: *See—*
Branson, Charles D.; and Demi, Roy C., 4,159,800, Cl. 236-15.00A.

Denis, Louis H. D.; Bedue, Abel J. H.; and Malherbaud, Jacques, to Technip. Method of and arrangement for the seasonal storage and use of hot water produced in particular by electrical power-generating thermal and nuclear stations. 4,159,736, Cl. 165-104.00S.

Denka Chemical Corporation: *See—*
Edmondson, Morris S., 4,160,079, Cl. 526-295.000.

Dennison Manufacturing Company: *See—*
Carrish, Jeffrey J., 4,160,257, Cl. 346-159.000.

Denny, Richard W.: *See—*
Holmgren, William A.; Hasling, John S.; and Denny, Richard W., 4,160,204, Cl. 324-207.000.

Dentipressions Incorporated: *See—*
Baskas, Morris J.; and Berger, Sidney I., 4,159,570, Cl. 32-66.000.

De Salvo, Francis J., Jr.; and Murphy, Donald W., to Bell Telephone Laboratories, Incorporated. Method of preparing layered chalcogenides. 4,159,962, Cl. 252-182.100.

Deschenes, Charles L., to Fram Corporation. Precleaner assembly. 4,159,899, Cl. 55-454.000.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Schreyer, Gerd; Wirthwein, Rolf; Reissinger, Karl-Hermann; and Krekel, Jorg, 4,159,925, Cl. 203-28.000.
DeVito, Ronald: *See*—
Garguilo, Michael; and DeVito, Ronald, 4,159,672, Cl. 98-30.000.
de Vries, Louis, to Chevron Research Company. Succinimide dispersant combination. 4,159,956, Cl. 252-33.400.
de Vries, Louis, to Chevron Research Company. Mannich base dispersant combination. 4,159,957, Cl. 252-33.400.
de Vries, Louis, to Chevron Research Company. Succinate dispersant combination. 4,159,958, Cl. 252-33.400.
de Vries, Louis, to Chevron Research Company. Thiophosphonate dispersant combination. 4,159,959, Cl. 252-33.400.
Diatek, Inc.: *See*—
Kluge, Douglas J., 4,159,766, Cl. 206-306.000.
Dick, Lloyd C., to Mead Corporation, The. Load cap. 4,159,887, Cl. 414-786.000.
Dickson, Wesley B., to Advanced Equipment Corporation. Suspension system primarily designed for use with operable walls and partitions. 4,159,556, Cl. 16-87.40R.
Diembeck, Walter: *See*—
Eibl, Hansjorg; Diembeck, Walter; and Kovatchev, Stephen, 4,159,988, Cl. 260-340.90R.
Digital Products Corporation: *See*—
Bower, David S.; and Smith, Fred J., 4,160,125, Cl. 179-6.00D.
Dingwall, Andrew G. F., to RCA Corporation. Method of making a substrate contact for an integrated circuit. 4,159,561, Cl. 29-571.000.
Ditcher, John, to A-Lok Products Corporation. Gasket seal between sewer pipe and manhole opening. 4,159,829, Cl. 277-189.000.
Docutel Corporation: *See*—
Swartzendruber, Robert F., 4,159,782, Cl. 221-1.000.
Dodds, Thomas J., Jr.: *See*—
Barnes, Vera L.; Dodds, Thomas J., Jr.; Gibson, Harold F.; and Campbell, Carl M., Jr., 4,160,120, Cl. 178-22.000.
Doehlert, David H., to Fluid Coal Corporation. Producing fluid fuel from coal. 4,159,897, Cl. 44-51.000.
Dolinar, Kevin D.; and Burr, John F., to Consolidation Coal Company. Overcurrent protection apparatus. 4,160,282, Cl. 361-31.000.
Donado, Rafael A.: *See*—
Camara, Elias H.; Marianowski, Leonard G.; and Donado, Rafael A., 4,160,067, Cl. 429-16.000.
Dore, Jacky, to Sandoz Ltd. Pure and substantially pure asymmetric 1:2 cobalt complexes of monoazo compounds. 4,159,983, Cl. 260-145.00A.
Doria, Gianfederico; Romeo, Ciriaco; Corno, Maria L.; Lauria, Francesco; Sberze, Piero; and Tibolla, Marcellino, to Carlo Erba S.p.A. Substituted 2-cyclopropyl-chromones and pharmaceutical compositions and use thereof. 4,160,028, Cl. 424-248.510.
Dorn, Rainer; Koch, Christian; Reiter, Kurt; and Kunstle, Konrad, to Kraftwerk Union Aktiengesellschaft. Process for hydrogenized reconditioning of crude oil or residues derived therefrom into saturated light hydrocarbons. 4,159,936, Cl. 208-93.000.
Dorr-Oliver Incorporated: *See*—
Fitch, Elliot B.; and Albertson, Orris E., 4,159,682, Cl. 110-245.000.
Douglas, George R.: *See*—
Thompson, John H.; Douglas, George R.; and Wilson, Charles R., 4,160,231, Cl. 340-11.000.
Dow Chemical Company, The: *See*—
Roberts, Charles B., 4,159,966, Cl. 252-430.000.
Downing, Gilbert. Means and a method for the self-pollination of corn. 4,159,596, Cl. 47-58.000.
Doyel, John S. Wall mounted fluid dispenser. 4,159,788, Cl. 222-144.500.
Dravco Corporation: *See*—
Savage, Elton S., 4,159,945, Cl. 210-8.000.
Dresser Industries, Inc.: *See*—
James, Barry K.; and Terry, David R., 4,160,202, Cl. 323-24.000.
Dubreux, Bernard; Delavarenne, Serve Y.; and Schirmann, Jean-Pierre, to Produits Chimiques Ugine Kuhlmann. Acyloxy-N,N'-diacylmalonamides and methods for their preparation. 4,159,991, Cl. 260-401.000.
Dumont, Maurice: *See*—
Dalle, Jean L.; Dumont, Maurice; Fourcy, Andre; Freychet, Aime; and Gouzy, Andre, 4,159,595, Cl. 47-2.000.
Dunn, William H.: *See*—
Wurst, John W.; and Dunn, William H., 4,159,685, Cl. 112-158.00B.
Du Pont de Nemours, E. I., and Company: *See*—
Biddle, Nicholas, III; and Patterson, Roger A., 4,159,786, Cl. 222-64.000.
Bingham, Elena M.; and Elliott, Arthur J., 4,160,092, Cl. 544-286.000.
Sauers, Richard F., 4,160,034, Cl. 424-298.000.
Durant, Graham J.; Ganellin, Charon R.; and Owen, Geoffrey R., to Smith Kline & French Laboratories Limited. N-oxy and N-amino guanidines. 4,160,030, Cl. 424-263.000.
Durst, Paul T., to General Electric Company. Temperature responsive control device with improved hydraulic diaphragm. 4,160,225, Cl. 337-321.000.
Durville, Gerard; Moulin, Michel; Ramseier, Serge; and Zurcher, Erwin, to Cotonificio Cantoni S.p.A. Apparatus for the cutting of columns of thread loops. 4,159,558, Cl. 26-10.00R.
Duyfjes, Werner, to Merck & Co., Inc. Process for the preparation of a water-soluble complex of 2-(4'-thiazolyl)benzimidazole and for the preparation of anthelmintic fungicidal compositions. 4,160,029, Cl. 424-258.000.
Dye, Wayne K., Jr. Method of submerging floatation bodies and apparatus for performing same. 4,159,692, Cl. 114-333.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Gawlick, Heinz; Homburg, Axel; Siegelin, Werner; and Marondel, Gunther, deceased, 4,160,062, Cl. 428-365.000.
Dyrdahl, Gerald L. Traction device. 4,159,731, Cl. 152-228.000.
Dzhabarov, Nasim G.: *See*—
Ismatkhodzhaev, Sagdulla K.; Usmanov, Salikh Z.; Mirsagatov, Mirmakhmud A.; Dzhabarov, Nasim G.; Takhirdzhanov, Makhirdzhan; and Mumindzhanov, Anvardzhan F., 4,160,196, Cl. 318-749.000.
Dziuk, Peter, to J. S. Staedtler. Tubular pen for recording apparatus. 4,160,256, Cl. 346-140.00A.
Eastman Kodak Company: *See*—
Corey, George P.; and Haas, Paul, Jr., 4,159,870, Cl. 354-32.000.
Gluck, Ronald M., 4,159,917, Cl. 148-1.500.
Hailey, Keith R.; and Quinton, Michael, 4,160,264, Cl. 358-29.000.
Irick, Gether, Jr.; and Kelly, Charles A., 4,159,985, Cl. 260-302.00D.
Eberspacher, J.: *See*—
Ottle, Walter, 4,160,010, Cl. 422-180.000.
Ebert, Claus; and Fabian, Wolfgang, to Isopol A.G. Bearer panel with movable supporting devices. 4,159,601, Cl. 52-36.000.
Ed. Zublin Aktiengesellschaft: *See*—
Mundel, Gunter; and Poutet, Jean-Claude, 4,160,146, Cl. 219-58.000.
Eda, Yasuko: *See*—
Yamada, Hirotada; Okamura, Kousaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,160,087, Cl. 544-28.000.
Edmondson, Morris S., to Denka Chemical Corporation. Novel sulfur compound modifiers for chloroprene polymerization. 4,160,079, Cl. 526-295.000.
Edmund, John R.: *See*—
Cameto, Leon R.; and Edmund, John R., 4,159,803, Cl. 239-102.000.
Egan, Edward G.; and Jackson, Ian S., to Varian Techtron Proprietary Limited. Flameless atomization. 4,159,876, Cl. 356-312.000.
Egan Machinery Company: *See*—
Russell, Alfred G.; and Schwetz, Michael W., 4,159,661, Cl. 83-305.000.
Egee, Walter W.; and Cramer, Clarence W., to Campbell Soup Company. Cookie dispensing apparatus. 4,159,761, Cl. 198-422.000.
Eggers, Edward T.; Waldrop, Thomas W.; Sheesley, Donald L.; and Campbell, Willis R., to Sperry Rand Corporation. Collection and recycling apparatus for crop material particles in a roll forming machine. 4,159,615, Cl. 56-341.000.
Egysult Izzolampa es Villamossagi Reszvenytarsasag: *See*—
Kerekes, Bela, 4,160,186, Cl. 313-220.000.
Egyt Gyogyszervegyeszeti Gyar: *See*—
Levai, Laszlo; Mikite, Gyula; and Kis-Tamas, Attila, 4,160,035, Cl. 424-311.000.
Eibl, Hansjorg; Diembeck, Walter; and Kovatchev, Stephen, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Synthetic phospholipids, a process for their manufacture and their use. 4,159,988, Cl. 260-340.90R.
Eibl, Johann; Schwarz, Otto; and Elsinger, Fritz, to Immuno Aktiengesellschaft fur chemisch-medizinische Produkte. Method of producing a blood-coagulation-promoting preparation from human blood plasma. 4,160,025, Cl. 424-101.000.
Eicher, Walter, to Contraves AG. Switching method for measuring two neighboring flying targets or objects in succession. 4,160,267, Cl. 358-126.000.
Eizumi, Hideo: *See*—
Ohara, Isamu; Muranaka, Tsutomu; and Eizumi, Hideo, 4,160,221, Cl. 335-68.000.
Eldin, Jacques, to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A. Method of connecting optical fibers and connection bench. 4,159,900, Cl. 65-4.00B.
Electromedics, Inc.: *See*—
Prosky, Howard S., 4,159,648, Cl. 73-362.0AR.
Elektro-Physik, Hans Nix & Dr. -Ing E. Steingroever KG.: *See*—
Steingroever, Erich A.; and Nix, Hans F., 4,160,208, Cl. 324-202.000.
Eli Lilly and Company: *See*—
Herron, David K., 4,160,091, Cl. 544-16.000.
Elliott, Arthur J.: *See*—
Bingham, Elena M.; and Elliott, Arthur J., 4,160,092, Cl. 544-286.000.
Elmeg-Elektro-Mechanik Gesellschaft mit beschrankter Haftung: *See*—
Reuting, Hans-Werner, 4,160,222, Cl. 335-85.000.
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Emery, Richard T., executor: *See*—
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., 4,159,933, Cl. 204-180.00R.
Endicott, Donald L., Jr.; and Solarek, Daniel J., Jr., to United States of America, Navy. Parallel scanning system. 4,160,169, Cl. 250-570.000.
Eneman, Melvin, to United States of America, Army. Projectile fuze. 4,159,679, Cl. 102-237.000.

Envirotech Corporation: *See—*
Davis, Steven S., 4,159,951, Cl. 210-331.000.
Erickson, Lennart G.; and Worne, Howard E. Wastewater energy recycling method. 4,159,944, Cl. 210-6.000.
ESB United States, Inc.: *See—*
Margalit, Nehemiah; and Krouse, Philip E., 4,160,070, Cl. 429-194.000.
Esmil-Envirotech, Ltd.: *See—*
Kirkup, William M., 4,159,684, Cl. 110-346.000.
Estes, John H.; Kravitz, Stanley; and Suggitt, Robert M., to Texaco Inc. Crystalline aluminosilicate percursor. 4,160,011, Cl. 423-328.000.
Etat Francais: *See—*
Cluzel, Philippe H., 4,160,230, Cl. 340-9.000.
Etienne, Patrick; Massies, Jean; and Linh, Nguyen T., to Thomson-CSF. System for regulating molecular flux and its application to co-evaporation techniques. 4,160,166, Cl. 250-423.00R.
Eutectic Corporation: *See—*
Jaeger, Frederick T., 4,160,048, Cl. 427-142.000.
Evershed-Power Optics Limited: *See—*
Worsfold, Peter, 4,160,277, Cl. 358-166.000.
Ex-Cell-O Corporation: *See—*
Buckley, James E.; McKendrick, Thomas E.; North, Lee E.; and Mendelsohn, Nathan, 4,159,660, Cl. 82-3.000.
Exxon Research & Engineering Co.: *See—*
Lewis, William B., 4,159,938, Cl. 208-139.000.
Fa. August Thiele: *See—*
Rehbein, Friedhelm, 4,159,849, Cl. 299-34.000.
Fabian, Wolfgang: *See—*
Ebert, Claus; and Fabian, Wolfgang, 4,159,601, Cl. 52-36.000.
Fabri-Tek Incorporated: *See—*
Funck, Gordon W.; and Melcher, Robert J., 4,159,862, Cl. 339-186.00M.
Fagan, John L.: *See—*
Smith, Philip C.; and Fagan, John L., 4,160,291, Cl. 365-203.000.
Fairchild Camera and Instrument Corp.: *See—*
Martin, Stephen M.; and Miller, Ralph P., 4,160,246, Cl. 340-630.000.
Falk, Edward J., to Wagner Electric Corporation. Load sensing proportioning valve. 4,159,855, Cl. 303-24.00F.
Farnsworth, Robert P., to Hughes Aircraft Company. Rangefinder and digital single shot circuit. 4,159,873, Cl. 356-5.000.
Farr, David R.; and Horman, Ian. Process for treating an aqueous extract of a vegetable material. 4,160,042, Cl. 426-387.000.
Farris, William E., to Boeing Company, The. Automatic landing system for hydrofoil craft. 4,159,690, Cl. 114-275.000.
Favorite Manufacturing, Inc.: *See—*
Martin, Harlan W., 4,159,696, Cl. 119-48.000.
Feldmann, Eckard. Apparatus for the generation of specified deformations in specimen. 4,159,649, Cl. 73-788.000.
Fengels, Gerd, to Bruggemann & Brand KG. Load-carrying net for suspension externally of aircraft such as helicopters. 4,159,840, Cl. 294-77.000.
Fenocketti, Leonard P.; and Rapkin, Myron C., to Miles Laboratories, Inc. Multilayered test device for determining the presence of a liquid sample component, and method of use. 4,160,008, Cl. 422-56.000.
Fey, Maurice G.; and Wolf, Charles B., to Westinghouse Electric Corp. Method and apparatus for superheating gases. 4,160,118, Cl. 13-2.00P.
Fiat Societa per Azioni: *See—*
Palazzetti, Mario, 4,159,709, Cl. 126-271.000.
Fiber Industries, Inc.: *See—*
Allan, John T., 4,159,617, Cl. 57-247.000.
Fibus, C. Kenneth, to Steel City Corporation, The. Framing for shelves. 4,159,814, Cl. 248-243.000.
Ficker, Herman; and Konrad, John. Heating system utilizing fuel bearing multi-tube water jacket. 4,159,802, Cl. 237-8.00R.
Filatov, Nikolai A.: *See—*
Vinogradov, Evgeny N.; Ivanov, Jury A.; Filatov, Nikolai A.; Fomichev, Viktor S.; and Prutkovsky, Samuil A., 4,160,180, Cl. 310-157.000.
Finan, Michael A.: *See—*
Smith, Malcolm J.; Miles, Peter; Richardson, Norman; and Finan, Michael A., 4,159,946, Cl. 210-58.000.
Fischer, Michael C.: *See—*
Kusters, John A.; Leach, Jerry G.; and Fischer, Michael C., 4,160,183, Cl. 310-315.000.
Fitch, Elliot B.; and Albertson, Orris E., to Dorr-Oliver Incorporated. Fluid bed combustion with predrying of moist feed using bed sand. 4,159,682, Cl. 110-245.000.
Flint, Theodore R.: *See—*
Nodiff, Edward A., 4,160,064, Cl. 428-413.000.
Fluid Coal Corporation: *See—*
Doehlert, David H., 4,159,897, Cl. 44-51.000.
FMC Corporation: *See—*
Holter, Carl F., 4,159,776, Cl. 212-59.00R.
Focke, Heinz. Process and device for insertion of two rows of objects into a package. 4,159,609, Cl. 53-452.000.
Foerster, George S.: *See—*
Rao, M. Vikram; Foerster, George S.; and Hebbar, Ranna K., 4,159,908, Cl. 75-167.000.
Fomichev, Viktor S.: *See—*
Vinogradov, Evgeny N.; Ivanov, Jury A.; Filatov, Nikolai A.; Fomichev, Viktor S.; and Prutkovsky, Samuil A., 4,160,180, Cl. 310-157.000.
Fontainas, Luc M.: *See—*
Maes, Robert H.; and Fontainas, Luc M., 4,159,904, Cl. 75-10.00R.
Ford Motor Company: *See—*
Akman, Ahmet R., 4,159,702, Cl. 123-117.00A.
Braslaw, Jacob; and Pai, Purnachandra, 4,159,972, Cl. 260-2.300.
Kummer, Joseph T., 4,160,068, Cl. 429-82.000.
Forsthuber, Robert F. K.: *See—*
Kramer, Pieter; Compaan, Klaas; and Forsthuber, Robert F. K., 4,160,269, Cl. 358-128.000.
Foulkes, David M.: *See—*
Davies, George E.; and Foulkes, David M., 4,160,017, Cl. 424-10.000.
Fourcy, Andre: *See—*
Dalle, Jean L.; Dumont, Maurice; Fourcy, Andre; Freychet, Aime; and Gouzy, Andre, 4,159,595, Cl. 47-2.000.
Fowler, Gerald C.; and Hughey, Terence D. Reading machine. 4,160,242, Cl. 340-711.000.
Fram Corporation: *See—*
Deschenes, Charles L., 4,159,899, Cl. 55-454.000.
Frame, Robert R., to UOP Inc. Metal chelate catalyst and alkanolamine hydroxide on adsorptive support. 4,159,964, Cl. 252-428.000.
Frangatos, Gerassimos, to Mobil Oil Corporation. Lubricant compositions. 4,159,960, Cl. 252-49.900.
Franklin, Alfred A.: *See—*
Groben, Richard L.; Gryczka, Alfred J.; and Franklin, Alfred A., 4,160,038, Cl. 426-53.000.
Freeborn, John C., to Honeywell Inc. Signal transmission circuit with improved digital signal recovery. 4,160,157, Cl. 250-199.000.
Freedman, Raymond: *See—*
Schwan, Thomas J.; and Freedman, Raymond, 4,160,093, Cl. 546-82.000.
Freissmuth, Alfred: *See—*
Meichsner, Walter; Rock, Heinrich; Freissmuth, Alfred; Prietzel, Horst; Rellermeyer, Heinrich; Ullrich, Wolfgang; Pfluger, Erich; and Sindermann, Raymund, 4,159,906, Cl. 75-58.000.
Freychet, Aime: *See—*
Dalle, Jean L.; Dumont, Maurice; Fourcy, Andre; Freychet, Aime; and Gouzy, Andre, 4,159,595, Cl. 47-2.000.
Friedman, Louis. Telescoping wire dispenser. 4,159,795, Cl. 226-127.000.
Fripiat, Jose J.: *See—*
Seto, Herbert; Cruz, Maria I.; and Fripiat, Jose J., 4,159,994, Cl. 260-448.00C.
Fujikawa, Toyoharu: *See—*
Shimizu, Shotaro; and Fujikawa, Toyoharu, 4,160,241, Cl. 340-763.000.
Fujinaga, Masao: *See—*
Ono, Tetsuhiro; Aramaki, Minoru; Mizuno, Tamotsu; and Fujinaga, Masao, 4,160,012, Cl. 423-341.000.
Fujino, Masahiko; Fukuda, Tsunehiko; and Kitada, Chieko, to Takeda Chemical Industries, Ltd. Protected amino acids or peptides. 4,159,979, Cl. 260-112.50R.
Fujitsu Limited: *See—*
Moriya, Takao; Yamasawa, Masao; and Gambe, Hirohisa, 4,160,243, Cl. 340-347.00C.
Fujiwhara, Mitsuto; Sasaki, Takashi; and Uchida, Takashi, to Konishiroku Photo Industry Co., Ltd. Color photographic materials containing color image fading inhibitor. 4,159,910, Cl. 96-74.000.
Fukuda, Masataro: *See—*
Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, 4,160,014, Cl. 423-644.000.
Fukuda, Tsunehiko: *See—*
Fujino, Masahiko; Fukuda, Tsunehiko; and Kitada, Chieko, 4,159,979, Cl. 260-112.50R.
Fukuwatari, Takashi: *See—*
Kozuka, Mikio; Ono, Isao; and Fukuwatari, Takashi, 4,160,003, Cl. 264-87.000.
Fulenwider, John E.: *See—*
Belmonte, Carl; Dakss, Mark L.; and Fulenwider, John E., 4,159,793, Cl. 225-96.500.
Funck, Alfred, to ARBED - Acieries Reunies de Burbach-Eich-Dudelange S.A. Method of and means for determining the level of a metallic bath. 4,160,168, Cl. 250-564.000.
Funck, Gordon W.; and Melcher, Robert J., to Fabri-Tek Incorporated. Removable female polarizing guide for electrical connectors. 4,159,862, Cl. 339-186.00M.
Furukawa, Naotake: *See—*
Takeuchi, Tatsuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,159,616, Cl. 57-83.000.
Furukubo, Tatsumi: *See—*
Shibata, Norio; and Furukubo, Tatsumi, 4,159,626, Cl. 60-276.000.
Furuya, Katusuke: *See—*
Uchida, Isamu; Watanabe, Kenkichi; and Furuya, Katusuke, 4,159,607, Cl. 53-64.000.
Fuwa, Jyoichi, to Ricoh Company, Ltd. Optoelectronic reading apparatus. 4,160,279, Cl. 358-288.000.
Gabriel, Richard J., to Matrix Toys, Inc. Close coupling strut for construction set having clip fasteners. 4,159,592, Cl. 46-26.000.
Gachman Steel Company: *See—*
Joyce, Darrell L.; and Kessler, Richard E., 4,159,676, Cl. 101-3.00R.
Gambe, Hirohisa: *See—*
Moriya, Takao; Yamasawa, Masao; and Gambe, Hirohisa, 4,160,243, Cl. 340-347.00C.
Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, to Matsushita Electric Industrial Co., Ltd. Hydrogen storage material. 4,160,014, Cl. 423-644.000.

Ganellin, Charon R.: *See—*
Durant, Graham J.; Ganellin, Charon R.; and Owen, Geoffrey R., 4,160,030, Cl. 424-263.000.

Gangemi, Ronald J. Isolator filter. 4,159,954, Cl. 210-446.000.

Garguilo, Michael; and DeVito, Ronald. Scent producing apparatus for forced air system. 4,159,672, Cl. 98-30.000.

Garman, James A., to Caterpillar Tractor Co. Suspension system for tandem axle vehicles. 4,159,751, Cl. 180-22.000.

Garrett, William D.; and Barger, William R., to United States of America, Navy. Method for the control of mosquitos by the use of film-forming materials. 4,160,033, Cl. 424-285.000.

Garron, Stephen A.; and Odermann, Charles R., to Singer Company, The. Method of forming a buttonhole pattern. 4,159,688, Cl. 112-264.100.

Gatland, Geoffrey H.; and Robitaille, Kenneth L., to Vemco Products, Inc. Door operator with instant reverse feature. 4,159,598, Cl. 49-28.000.

Gawlick, Heinz; Homburg, Axel; Siegelin, Werner; and Marondel, Gunther, deceased (by Marondel, Gisela M., executrix), to Dynamit Nobel Aktiengesellschaft. Pyrotechnical sealing cord. 4,160,062, Cl. 428-365.000.

Gay, Donald L.: *See—*
Thomas, Frank J.; Gay, Donald L.; and Winsor, Chester A., 4,160,272, Cl. 364-602.000.

Gehring, Karlheinz: *See—*
Wrulich, Herwig; Gehring, Karlheinz; and Zitz, Alfred, 4,159,746, Cl. 175-354.000.

General Electric Company: *See—*
Carnahan, James C., Jr., 4,160,110, Cl. 568-703.000.
Durst, Paul T., 4,160,225, Cl. 337-321.000.
Houston, Douglas E., 4,159,916, Cl. 148-1.500.
Mark, Victor; and Wilson, Phillip S., 4,159,974, Cl. 260-30.200.
Niznik, George E., 4,160,088, Cl. 544-68.000.

General Mills, Inc.: *See—*
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,160,054, Cl. 424-48.000.

General Motors Corporation: *See—*
Koivunen, Erkki A., 4,159,653, Cl. 74-200.000.
Manz, David F.; Irwin, Clarence C.; and Salamon, Theodore M., 4,159,848, Cl. 297-474.000.
Miller, Larry D.; Johnston, Laird E.; Valus, John T.; and Powell, Thomas M., 4,159,834, Cl. 280-802.000.
Thompson, Douglas K., 4,159,888, Cl. 415-105.000.
Wiknich, Harold V., 4,159,704, Cl. 123-188.0AP.

Geosource Inc.: *See—*
Mayne, William H.; Hawes, William S.; and Badger, Algernon S., 4,160,233, Cl. 340-15.5MC.

Gewerkschaft Eisenhutte Westfalia: *See—*
Bargel, Gunther; and Husemann, Heinz, 4,159,819, Cl. 254-29.00R.
Lobbe, Armin; and Steinkuhl, Bernd, 4,159,850, Cl. 299-34.000.
Rosler, Wulff, 4,159,851, Cl. 299-43.000.

Gibson, Harold F.: *See—*
Barnes, Vera L.; Dodds, Thomas J., Jr.; Gibson, Harold F.; and Campbell, Carl M., Jr., 4,160,120, Cl. 178-22.000.

Gillette Company, The: *See—*
Ascoli, Enzo, 4,160,177, Cl. 310-22.000.

Gluck, Ronald M., to Eastman Kodak Company. Method for use in the manufacture of semiconductor devices. 4,159,917, Cl. 148-1.500.

Gneupel, Arthur. Ozone generator. 4,159,971, Cl. 250-540.000.

Gogneau, Achille. Turbulent flow conveying device for a mixture. 4,159,881, Cl. 366-337.000.

Goldschmidt, Arthur M.; and Hedlund, Lee V., to RCA Corporation. Tracking servo system for video disc player/recorder. 4,160,270, Cl. 358-128.000.

Golser, Leopold, to Chemie Linz Aktiengesellschaft. Process for the production of foamed plastics with improved combustion characteristics. 4,160,075, Cl. 521-158.000.

Goodwin, Robert J.: *See—*
Shelton, Frederic J.; Wetzel, William H.; Wilkinson, John E.; and Goodwin, Robert J., 4,160,114, Cl. 568-776.000.

Gorike, Rudolf, to AKG Akustische u.Kino-Gerate Gesellschaft m.b.H. Closed earphone construction. 4,160,135, Cl. 179-182.00R.

Goto, Kunio; Tajima, Osamu; and Miyatake, Hideaki, to Victor Company of Japan, Ltd. Signal pickup device with tracking control and jitter compensation for a video disc. 4,160,268, Cl. 358-128.000.

Gotz, Manfred K.: *See—*
Immer, Hans U.; Nelson, Verner R.; and Gotz, Manfred K., 4,159,980, Cl. 260-112.5LH.

Gould Inc.: *See—*
Clausing, Charles I., 4,160,142, Cl. 200-254.000.
Clement, Ralph C.; and Latimer, William R., 4,160,137, Cl. 200-42.00T.
Karbo, Donald J.; Betts, David A.; and Pauer, Lyle A., 4,160,234, Cl. 340-58.000.
Shemtov, Sami, 4,159,859, Cl. 339-14.00L.

Gouzy, Andre: *See—*
Dalle, Jean L.; Dumont, Maurice; Fourcy, Andre; Freychet, Aime; and Gouzy, Andre, 4,159,595, Cl. 47-2.000.

Graf, Alban: *See—*
Guanella, Gustav; and Graf, Alban, 4,160,123, Cl. 179-1.50R.

Graf, Ronald E. Electrostatic switch. 4,160,141, Cl. 200-181.000.

Graham Magnetics, Inc.: *See—*
Deffeyes, Robert J.; and Armstrong, Harris W., 4,160,284, Cl. 361-433.000.

Grant, Frederic F. Tape transport cartridge. 4,159,811, Cl. 242-192.000.

Grantham, Frederick W. Automatic cleaning apparatus. 4,159,632, Cl. 68-9.000.

Gras, Gilbert: *See—*
Leveque, Jean-Luc; Gras, Gilbert; and Scot, Jean, 4,159,640, Cl. 73-81.000.

Grayson, Suzanne; and Schaefer, Dora, to Helena Rubinstein, Inc. Cosmetic selection and display system. 4,160,271, Cl. 364-400.000.

Graziano, Sinibaldo. Continuous process for decontaminating and cleaning the outer surface of plastic containers to permit printing thereon. 4,159,553, Cl. 15-101.000.

Great Lakes Chemical Corporation: *See—*
Levek, Robert P.; Mamuzic, Rastko I.; and Sands, John L., 4,160,112, Cl. 568-755.000.

Greber, Gerd: *See—*
Kvita, Vratislav; Darms, Roland; and Greber, Gerd, 4,160,081, Cl. 528-93.000.

Greer, Raymond T.; McConnell, Kenneth G.; and Akers, Arthur, to Iowa State University Research Foundation, Inc. Method and apparatus for separating particles. 4,159,942, Cl. 209-143.000.

Greven, Hendrik M.: *See—*
Rittel, Werner; Brugger, Max; Kamber, Bruno; Riniker, Bernhard; Sieber, Peter; and Greven, Hendrik M., 4,159,981, Cl. 260-112.50T.

Grimwood, Geoffrey L.; and Jackson, Joseph F. Desludger type disc bowl centrifuges. 4,159,798, Cl. 233-20.00A.

Griset, Ernest J., Jr., to Akzona Incorporated. Method for producing novelty yarns. 4,159,619, Cl. 57-295.000.

Groben, Richard L.; Gryczka, Alfred J.; and Franklin, Alfred A., to Microlife Technics, Inc. Lactic acid fermentate flavored pet food. 4,160,038, Cl. 426-53.000.

Grotheer, Morris P., to Hooker Chemicals & Plastics Corp. Chemical and electro-chemical process for production of alkali metal chlorates. 4,159,929, Cl. 204-95.000.

Grube, Clifford E.: *See—*
Peterson, Samuel F.; and Grube, Clifford E., 4,159,714, Cl. 128-24.200.

Gruner, George P. Contra rotating rotors with differential gearing. 4,159,624, Cl. 60-39.16C.

Gryczka, Alfred J.: *See—*
Groben, Richard L.; Gryczka, Alfred J.; and Franklin, Alfred A., 4,160,038, Cl. 426-53.000.

GTE Automatic Electric Laboratories Incorporated: *See—*
McGough, Gerald B., 4,160,136, Cl. 179-184.000.

GTE Laboratories Incorporated: *See—*
Belmonte, Carl; Dakss, Mark L.; and Fulenwider, John E., 4,159,793, Cl. 225-96.500.

GTE Sylvania Incorporated: *See—*
Bojanek, Robert J.; and Mason, Marvin S., 4,160,126, Cl. 179-15.0AT.
Marchetti, Charles R.; and Mason, Marvin S., 4,160,130, Cl. 179-18.0EA.
Say, Donald L.; Smithgall, Harry E.; and Speigel, Kenneth, 4,160,187, Cl. 313-408.000.

Guanella, Gustav; and Graf, Alban, to Patelhold Patentverwertungs- & Elektro-Holding AG. Methods of and apparatus for the encoded transmission of information. 4,160,123, Cl. 179-1.50R.

Guerrieri, Franco: *See—*
Agnes, Giovanni; Bimbi, Giuseppe; Guerrieri, Franco; and Rucci, Guglielmo, 4,160,107, Cl. 560-204.000.

Guinosso, Charles J.: *See—*
Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,160,100, Cl. 560-43.000.

Gummi-Kraus GmbH: *See—*
Kraus, Friedrich; and Kalbas, Berthold, 4,159,728, Cl. 150-2.100.

Guthrie, James L.; and Bach, Donald J., to W. R. Grace & Co. Simulated natural sponge based on hydrophilic polyurethane. 4,160,076, Cl. 521-159.000.

Gyarmati nee Hardik, Maria: *See—*
Rothman, Gyorgy; Babos, Gyorgy; Gyarmati nee Hardik, Maria; Hegedus, Arpad; and Rofa, Otto, 4,160,197, Cl. 318-396.000.

H. J. Langen & Sons Ltd.: *See—*
Langen, Marinus J. M., 4,159,610, Cl. 53-525.000.

Haag, Werner O.; and Huang, Tracy J., to Mobil Oil Corporation. Conversion of synthesis gas to hydrocarbon mixtures utilizing dual reactors. 4,159,995, Cl. 260-450.000.

Haas, Paul, Jr.: *See—*
Corey, George P.; and Haas, Paul, Jr., 4,159,870, Cl. 354-32.000.

Hachtmann, William R.: *See—*
Knight, Arlen M.; and Hachtmann, William R., 4,159,554, Cl. 15-321.000.

Haerr, Raymond H., to Xomed, Inc. Moisture-expandable ear wick. 4,159,719, Cl. 128-260.000.

Hailey, Keith R.; and Quinton, Michael, to Eastman Kodak Company. Matrix compensator for color video signals. 4,160,264, Cl. 358-29.000.

Haines, Fred E. Printed circuit board tester with removable head. 4,160,207, Cl. 324-158.00F.

Hall, John B.: *See—*
Sprecker, Mark A.; Kryschuk, John J.; and Hall, John B., 4,159,987, Cl. 260-340.90R.

Halliburton Company: *See—*
Howe, Thomas W., Jr., 4,159,777, Cl. 213-10.000.

Ham, Robert K., to Reserve Synthetic Fuels, Inc. Method of testing a landfill for its methane potential. 4,159,893, Cl. 23-230.0EP.

Hamabe, Ko'hei, to Hitachi Shipbuilding & Engineering Co., Ltd. Boiler apparatus containing denitrator. 4,160,009, Cl. 422-108.000.

Hamashima, Yoshio: *See—*
Tsuji, Teruji; Hamashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,160,085, Cl. 544-16.000.

Hamlin, Thomas J.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,159,824, Cl. 271-3.000.

Hamrick, Joseph T.: *See—*
Rose, Leslie C.; and Hamrick, Joseph T., 4,159,743, Cl. 166-302.000.

Hancock, John J. Pneumatic jogging platform. 4,159,826, Cl. 272-65.000.

Handkammer, Herbert K. Method of casting. 4,159,732, Cl. 164-137.000.

Haniuda, Nobuyoshi: *See—*
Masuda, Koji; and Haniuda, Nobuyoshi, 4,159,687, Cl. 112-262.300.

Harco Corporation: *See—*
Merrick, Larry H., 4,160,171, Cl. 307-95.000.

Hardtmann, Goetz E., to Sandoz, Inc. Oxindoles as sleep-inducers. 4,160,032, Cl. 424-274.000.

Harner, Kermit I.; Kos, Joseph M.; and Patrick, John P., to United Technologies Corporation. Wind turbine generator pitch control system. 4,160,170, Cl. 290-44.000.

Harper, David J.: *See—*
Brooks, John L.; Budziarek, Richard; and Harper, David J., 4,160,077, Cl. 525-332.000.

Hart, Charles G.: *See—*
Kovacs, Lloyd; and Hart, Charles G., 4,159,760, Cl. 198-419.000.

Hartmann, Rudolf: *See—*
Pietzsch, Ludwig; Kauer, Harald; and Hartmann, Rudolf, 4,159,856, Cl. 305-51.000.

Hasegawa, Hiroshi; Ohtsubo, Yoshiaki; Watanabe, Sakuji; and Takahata, Kouichi, deceased (by Takahata, Kosaku, legal successor), to Nippon Kogaku K.K. Circuit for integrating a quantity of light in an automatic control type flash unit. 4,160,160, Cl. 250-214.00P.

Hasling, John S.: *See—*
Holmgren, William A.; Hasling, John S.; and Denny, Richard W., 4,160,204, Cl. 324-207.000.

Hatten, Philip A.; and Hyman, Jerome H. Vending machine adapter. 4,159,769, Cl. 206-527.000.

Hattori, Torao, to Honda Giken Kogyo Kabushiki Kaisha. Automatic transmission apparatus. 4,159,654, Cl. 74-331.000.

Haubner, Georg: *See—*
Weckenmann, Albert; Wesemeyer, Jurgen; Haubner, Georg; Meier, Werner; and Zobl, Hartmut, 4,160,238, Cl. 340-147.00R.

Hauser, Stephen G., to Abbott Laboratories. Specimen holder. 4,159,875, Cl. 356-244.000.

Hausfeld, A. David. Self-sustaining plasma discharge display device. 4,160,191, Cl. 315-169.400.

Haverkamp, Klaus D.: *See—*
Peters, Werner; Langhoff, Josef; Henkel, Siegfried; and Haverkamp, Klaus D., 4,159,905, Cl. 75-42.000.

Hawes, William S.: *See—*
Mayne, William H.; Hawes, William S.; and Badger, Algernon S., 4,160,233, Cl. 340-15.5MC.

Hawkes, Ivor, to United States of America, Interior. Vibrating wire stress meter. 4,159,641, Cl. 73-778.000.

Hayashida, Sanae; and Sasaki, Gorou. Filter apparatus. 4,159,950, Cl. 210-330.000.

Hayssen Manufacturing Company: *See—*
Kovacs, Lloyd; and Hart, Charles G., 4,159,760, Cl. 198-419.000.

Hebbar, Ranna K.: *See—*
Rao, M. Vikram; Foerster, George S.; and Hebbar, Ranna K., 4,159,908, Cl. 75-167.000.

Heckelsberg, Louis F., to Phillips Petroleum Company. Alkaline earth oxides promoted with manganese oxide and/or rhenium oxide as catalysts for cracking and dehydrocyclizing of alkanes. 4,159,970, Cl. 252-471.000.

Hedgewick, Peter, to International Tools (1973) Limited. Safety package with threaded stop lock. 4,159,779, Cl. 215-214.000.

Hedlund, Lee V.: *See—*
Goldschmidt, Arthur M.; and Hedlund, Lee V., 4,160,270, Cl. 358-128.000.

Hegedus, Arpad: *See—*
Rothman, Gyorgy; Babos, Gyorgy; Gyarmati nee Hardik, Maria; Hegedus, Arpad; and Rofa, Otto, 4,160,197, Cl. 318-396.000.

Heim, Helmut, to Manufacture Belge d'Aiguilles S.A. Process for smoothing the eye of a needle and needle made thereby. 4,159,686, Cl. 112-222.000.

Helena Rubinstein, Inc.: *See—*
Grayson, Suzanne; and Schaefer, Dora, 4,160,271, Cl. 364-400.000.

Henkel, Siegfried: *See—*
Peters, Werner; Langhoff, Josef; Henkel, Siegfried; and Haverkamp, Klaus D., 4,159,905, Cl. 75-42.000.

Herfeld, Friedrich W. Circulation mixer. 4,159,880, Cl. 366-266.000.

Hermansson, Anne-Marie I. Protein/starch complex. 4,159,982, Cl. 260-119.000.

Herron, David K., to Eli Lilly and Company. Process for preparation of 3-halo-3-methylcephams. 4,160,091, Cl. 544-16.000.

Hewlett-Packard Company: *See—*
Kusters, John A.; Leach, Jerry G.; and Fischer, Michael C., 4,160,183, Cl. 310-315.000.

Hewson, Clifford B., to Moldex Limited. Lift-off hinge assembly for toilets and the like. 4,159,548, Cl. 4-236.000.

Hickman, Ronald P., to Inventec International Limited. Collapsible dual-height workbench. 4,159,821, Cl. 269-139.000.

Hill, David G.: *See—*
Curran, Adrian C. W.; Crossley, Roger; and Hill, David G., 4,160,094, Cl. 546-152.000.

Hill, Francis K.: *See—*
Jacobson, Carl C.; Manning, Mark C.; and Hill, Francis K., 4,159,877, Cl. 366-22.000.

Hill, Joseph: *See—*
Alles, David S.; and Hill, Joseph, 4,159,799, Cl. 235-486.000.

Hiraiwa, Kazuyoshi; and Takahashi, Kotei, to Nissan Motor Company, Limited. Torque converter with an improved housing construction. 4,159,628, Cl. 60-364.000.

Hirosawa, Katsu: *See—*
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, 4,159,890, Cl. 425-59.000.

Hisamatsu, Takashi: *See—*
Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Watanabe, Hiroshi; Kojima, Michio; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Shingo, 4,160,026, Cl. 424-116.000.

Hitachi, Ltd.: *See—*
Ikegami, Akira; Tosaki, Hiromi; Yamada, Jun; Mozume, Teruo; Tsubokawa, Ichiro; and Sakashita, Kiyoshi, 4,160,227, Cl. 338-22.00R.
Oka, Takafumi; and Nakanishi, Hiroshi, 4,160,236, Cl. 340-146.1AL.

Hitachi Metals, Ltd.: *See—*
Kuroda, Masanobu; Noda, Kazuo; and Kobayashi, Shinichi, 4,159,733, Cl. 164-211.000.

Hitachi Shipbuilding & Engineering Co., Ltd.: *See—*
Hamabe, Ko'hei, 4,160,009, Cl. 422-108.000.

Hix, Larry J.; Wise, Phillip W.; and Bennyhoff, David H., to Atlantic Richfield Company. Method and apparatus for testing marine seismic cables. 4,160,228, Cl. 340-7.00R.

Hobbs, Geoffrey; Jason, Alfred C.; and Richards, John C. S., to National Research Development Corporation. Detection of bacterial activity. 4,160,205, Cl. 324-65.00R.

Hoch, Samuel; Lally, Robert E.; and Ceprini, Mario Q., to Tenneco Chemicals, Inc. Stabilizer systems and vinyl halide resin compositions containing same. 4,159,973, Cl. 260-23.0XA.

Hoddinott, David C.; and Jette, Edwin L., Jr., to Crompton & Knowles Corporation. Strand drying apparatus. 4,159,579, Cl. 34-155.000.

Hodkinson, Trevor, to Hodkinson, Trevor; Control Switchboards Pty, Ltd.; and McCormack, Neil Charles. Cassette re-winding device. 4,159,810, Cl. 242-198.000.

Hoechst Aktiengesellschaft: *See—*
Muller, Werner H.; Riedel, Knut; and Krekeler, Hans, 4,160,113, Cl. 568-772.000.
Patzner, Alfred; and Kruger, Josef, 4,160,006, Cl. 264-292.000.
Pistorius, Rudolf, 4,160,109, Cl. 568-667.000.

Hoffman, Alfred A., Jr.: *See—*
Hutto, John F.; and Hoffman, Alfred A., Jr., 4,160,000, Cl. 568-576.000.

Holliday, David H. Removable bin system in a collator. 4,159,825, Cl. 271-173.000.

Holmes, William K.: *See—*
Pueschner, Philip; Holmes, William K.; Thiele, Duane L.; Stearn, Richard A.; Lenius, Norbert W.; and Keller, Lynn L., 4,159,778, Cl. 414-460.000.

Holmgren, William A.; Hasling, John S.; and Denny, Richard W., to Kaman Sciences Corporation. Non-contact distance measurement system. 4,160,204, Cl. 324-207.000.

Holter, Carl F., to FMC Corporation. Tower crane. 4,159,776, Cl. 212-59.00R.

Holtvoigt, Werner: *See—*
Praetorius, Heinz; Seibert, Karl; and Holtvoigt, Werner, 4,159,975, Cl. 525-91.000.

Homburg, Axel: *See—*
Gawlick, Heinz; Homburg, Axel; Siegelin, Werner; and Marondel, Gunther, deceased, 4,160,062, Cl. 428-365.000.

Homma, Yuzuru; and Morihara, Kazuyuki, to Shionogi & Co., Ltd. Toxoids derived from protease and elastase of *Pseudomonas aeruginasa* and production thereof. 4,160,023, Cl. 424-87.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Hattori, Torao, 4,159,654, Cl. 74-331.000.
Matsubara, Soichi; Niikawa, Ryo; and Numata, Morikuni, 4,160,147, Cl. 219-87.000.

Honda Gikenkogyo Kabushiki Kaisha: *See—*
Osada, Isao; and Sano, Shoichi, 4,159,730, Cl. 152-158.000.

Honeywell Inc.: *See—*
Freeborn, John C., 4,160,157, Cl. 250-199.000.
McGough, Ronald B., 4,160,229, Cl. 340-7.00R.

Honsel, Karl-Heinz; Niehaus, Hans-Rudolf; and Muhlenweg, Karl, to Karl-Heinz Honsel. Apparatus for feeding seriatim discrete webs of paper or the like. 4,159,807, Cl. 242-57.000.

Honshu Seishi Kabushiki Kaisha: *See—*
Samejima, Tadanori, 4,160,059, Cl. 428-288.000.

Hood, Clarence E.; Webb, Byron K.; and Alper, Yekutiel, to Clemson University. Crop uprooting and soil working apparatus. 4,159,745, Cl. 172-44.000.

Hooker Chemicals & Plastics Corp.: *See—*
Grotheer, Morris P., 4,159,929, Cl. 204-95.000.

Hoos, Pieter F., to Walworth Company. Rotary valve top seal assembly. 4,159,818, Cl. 251-214.000.

Horman, Ian: *See—*
Farr, David R.; and Horman, Ian, 4,160,042, Cl. 426-387.000.

Horstmann, Harald: *See—*
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,160,098, Cl. 548-374.000.

Horter, Robert. Sanitary pressure relief device. 4,159,721, Cl. 137-317.000.

Horton, Robert L., to Phillips Petroleum Company. Liquid chromatograph/mass spectrometer interface. 4,160,161, Cl. 250-281.000.

Houston, Douglas E., to General Electric Company. Thermal migration of fine lined cross-hatched patterns. 4,159,916, Cl. 148-1.500.

Howe, Thomas W., Jr., to Halliburton Company. Universal fabricated backstop/buffstop. 4,159,777, Cl. 213-10.000.

Hsieh, Hsiun P., to Aluminum Company of America. Method of reducing the gel and cure times for polyester-alumina trihydrate dispersions by blending therewith small quantities of activated alumina. 4,159,977, Cl. 260-40.00R.

Hu, John C., to Boeing Company, The. Method for determining formulation and chemical structure of materials by improved pyrolysis gas chromatography. 4,159,894, Cl. 23-230.0PC.

Huang, Tracy J.: *See—*
Haag, Werner O.; and Huang, Tracy J., 4,159,995, Cl. 260-450.000.

Hubka, Theodore; and Slater, Robert W., to Singer Company, The. Solid state pulsed coherent Doppler radar. 4,160,248, Cl. 343-8.000.

Hudon, Paul A., administrator: *See—*
Johnson, Arthur R., deceased; Hudon, Paul A., administrator; and Kesten, Martin, 4,159,655, Cl. 74-571.00L.

Hudson, George S.; and Roy, Madan M., to Avco Corporation. Aircraft transmission test set. 4,159,642, Cl. 73-118.000.

Hughes Aircraft Company: *See—*
Farnsworth, Robert P., 4,159,873, Cl. 356-5.000.
Kotlarski, Joseph R., 4,160,249, Cl. 343-9.000.

Hughes, John; and Maul, Peter L., to American Colloid Company. Method for reducing the formation of slag and soot formed from the combustion of carbonaceous waste material. 4,159,683, Cl. 110-343.000.

Hughey, Terence D.: *See—*
Fowler, Gerald C.; and Hughey, Terence D., 4,160,242, Cl. 340-711.000.

Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., to United States Borax & Chemical Corporation. Nitrophenylhydrazine compounds. 4,160,090, Cl. 544-164.000.

Husemann, Heinz: *See—*
Bargel, Gunther; and Husemann, Heinz, 4,159,819, Cl. 254-29.00R.

Hutcheon, Robert S.: *See—*
Barquist, William S., Jr.; and Hutcheon, Robert S., 4,160,212, Cl. 325-432.000.

Hutto, John F.; and Hoffman, Alfred A., Jr., to Phillips Petroleum Company. Extraction of hydroperoxides. 4,160,000, Cl. 568-576.000.

Hyman, Jerome H.: *See—*
Hatten, Philip A.; and Hyman, Jerome H., 4,159,769, Cl. 206-527.000.

I.W.S. Nominee Company Limited: *See—*
Benisek, Ladislav, 4,160,051, Cl. 427-352.000.
Mizell, Louis R., 4,159,883, Cl. 401-201.000.

Iida, Takashi: *See—*
Yasukuni, Mitsuo; Iida, Takashi; and Kiten, Hiroshi, 4,159,864, Cl. 350-184.000.

Ikawa, Michio: *See—*
Kaul, Pradeep P.; Scholl, Thomas H.; Muzundar, Deepak R.; Wendling, Daniel R.; Buschman, Bob D.; Ikawa, Michio; Miura, Akira; and Love, David A., 4,160,131, Cl. 179-99.00M.

Ikawa, Reiji, to Tokyo Special Wire Netting Co., Ltd. Mold for manufacturing distillation column packing. 4,159,817, Cl. 249-98.000.

Ikegami, Akira; Tosaki, Hiromi; Yamada, Jun; Mozume, Teruo; Tsubokawa, Ichiro; and Sakashita, Kiyoshi, to Hitachi, Ltd. Thermistor composition and thick film thermistor. 4,160,227, Cl. 338-22.00R.

Ikegami, Tadashi: *See—*
Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; and Miya, Masayoshi, 4,159,963, Cl. 252-429.00B.
Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; and Tsuyama, Shigeo, 4,159,965, Cl. 252-429.00B.

Illinois Tool Works Inc.: *See—*
Olsen, Robert C., 4,159,597, Cl. 47-58.000.

Ilukowicz, Robert J., to Preco Industries Ltd. Parking curb reinforcing bar support. 4,159,605, Cl. 52-687.000.

Imamura, Tomoatsu; Araki, Shigeyuki; Iwata, Nobuo; and Yoshimi, Masahiro, to Ricoh Company, Ltd. Servo control apparatus. 4,160,200, Cl. 318-616.000.

Immer, Hans U.; Nelson, Verner R.; and Gotz, Manfred K., to American Home Products Corporation. Process for preparing the releasing hormone of luteinizing hormone (LH) and of follicle stimulating hormone (FSH), salts and compositions thereof, and intermediates therefor. 4,159,980, Cl. 260-112.5LH.

Immuno Aktiengesellschaft fur chemisch-medizinische Produkte: *See—*
Eibl, Johann; Schwarz, Otto; and Elsinger, Fritz, 4,160,025, Cl. 424-101.000.

Imperial Chemical Industries Limited: *See—*
Birchall, James D.; and Pybus, Roger M., 4,159,913, Cl. 106-307.000.
Brooks, John L.; Budziarek, Richard; and Harper, David J., 4,160,077, Cl. 525-332.000.
Davies, George E.; and Foulkes, David M., 4,160,017, Cl. 424-10.000.
Vasey, Charles H.; and Waddan, Dhafir Y., 4,160,115, Cl. 568-857.000.

Inbody, Melvin R., to Centerline Steering Safety Axle Corporation, The. Centerline two piece wheel and brake assembly. 4,159,832, Cl. 280-96.300.

Industrie Pirelli, S.p.A.: *See—*
Pizzorno, Augusto, 4,160,007, Cl. 264-334.000.

Inohara, Akio; Takahashi, Koji; and Inoue, Ryoji, to Sharp Kabushiki Kaisha. Method of connecting an element having multiple terminals and a multi-lead flexible connector. 4,159,921, Cl. 156-272.000.

Inoue, Keizo: *See—*
Ota, Sadayasu; and Inoue, Keizo, 4,159,822, Cl. 269-325.000.

Inoue, Ryoji: *See—*
Inohara, Akio; Takahashi, Koji; and Inoue, Ryoji, 4,159,921, Cl. 156-272.000.

Inoue, Shigeharu: *See—*
Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Watanabe, Hiroshi; Kojima, Michio; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Shingo, 4,160,026, Cl. 424-116.000.

Institut Francais du Petrole: *See—*
Cohen, Choua; and Sillion, Bernard, 4,159,898, Cl. 44-63.000.

Institute of Gas Technology: *See—*
Camara, Elias H.; Marianowski, Leonard G.; and Donado, Rafael A., 4,160,067, Cl. 429-16.000.

Instrumentation Specialties Company: *See—*
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., 4,159,933, Cl. 204-180.00R.

International Business Machines Corporation: *See—*
Anantha, Narasipur G.; Bhatia, Harsaran S.; and Walsh, James L., 4,159,915, Cl. 148-1.500.
Lee, Hsing-San; Pricer, Wilbur D.; and Vogl, Norbert G., Jr., 4,160,275, Cl. 365-149.000.

International Flavors & Fragrances Inc.: *See—*
Sprecker, Mark A.; Kryschuk, John J.; and Hall, John B., 4,159,987, Cl. 260-340.90R.

International Paper Company: *See—*
Roozee, William F., 4,159,797, Cl. 229-27.000.

International Standard Electric Corporation: *See—*
Viohl, Uwe; and Zondler, Rolf, 4,159,931, Cl. 204-152.000.

International Telephone and Telegraph Corporation: *See—*
Anhalt, John W., 4,159,861, Cl. 339-75.0MP.
Carroll, James C., 4,160,134, Cl. 179-175.30R.

International Tools (1973) Limited: *See—*
Hedgewick, Peter, 4,159,779, Cl. 215-214.000.

Interx Research Corporation: *See—*
Bodor, Nicolae S., 4,160,099, Cl. 560-110.000.

Inventec International Limited: *See—*
Hickman, Ronald P., 4,159,821, Cl. 269-139.000.

Invernizzi, Rutilio; and Prella, Giovanni, to Societe d'Assistance Technique pour Produits Nestle S.A. Preparation of processed cheeses containing nutmeats. 4,160,044, Cl. 426-582.000.

Iowa State University Research Foundation, Inc.: *See—*
Greer, Raymond T.; McConnell, Kenneth G.; and Akers, Arthur, 4,159,942, Cl. 209-143.000.

Irick, Gether, Jr.; and Kelly, Charles A., to Eastman Kodak Company. Heterocyclic phenyl ester ultraviolet stabilizers. 4,159,985, Cl. 260-302.00D.

Irie, Kenji: *See—*
Yamada, Hirotada; Okamura, Kousaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,160,087, Cl. 544-28.000.

Irwin, Clarence C.: *See—*
Manz, David F.; Irwin, Clarence C.; and Salamon, Theodore M., 4,159,848, Cl. 297-474.000.

Ishikawajima-Harima Heavy Industries Co., Ltd.: *See—*
Simms, Romilly J.; and Madsen, Byron K., 4,159,639, Cl. 73-63.000.

Ismatkhodzhaev, Sagdulla K.; Usmanov, Salikh Z.; Mirsagatov, Mirmakhmud A.; Dzhabarov, Nasim G.; Takhirdzhanov, Makhirdzhan; and Mumindzhanov, Anvardzhan F. Two-phase AC electric motor control circuit. 4,160,196, Cl. 318-749.000.

Isopol A.G.: *See—*
Ebert, Claus; and Fabian, Wolfgang, 4,159,601, Cl. 52-36.000.

ITT Industries, Incorporated: *See—*
Oberthuer, Heinrich; Burgdorf, Jochen; and Luepertz, Hans-Henning, 4,159,853, Cl. 303-6.00C.

Ivanov, Jury A.: *See—*
Vinogradov, Evgeny N.; Ivanov, Jury A.; Filatov, Nikolai A.; Fomichev, Viktor S.; and Prutkovsky, Samuil A., 4,160,180, Cl. 310-157.000.

Iwai, Kazuo, to Yoshida Kogyo Kabushiki Kaisha. Separable boat. 4,159,551, Cl. 9-2.00A.

Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Watanabe, Hiroshi; Kojima, Michio; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Shingo, to Meiji Seika Kaisha, Ltd. Antibiotics SF-1130-x_1 and -x_2 substances and production and use thereof. 4,160,026, Cl. 424-116.000.

Iwata, Nobuo: *See—*
Imamura, Tomoatsu; Araki, Shigeyuki; Iwata, Nobuo; and Yoshimi, Masahiro, 4,160,200, Cl. 318-616.000.

Izawa, Akio: *See—*
Yamada, Hirotada; Okamura, Kousaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,160,087, Cl. 544-28.000.

J. I. Case Company: *See*—
Pueschner, Philip; Holmes, William K.; Thiele, Duane L.; Stearn, Richard A.; Lenius, Norbert W.; and Keller, Lynn L., 4,159,778, Cl. 414-460.000.

J. R. Schneider Co.: *See*—
Crowe, William D., 4,159,948, Cl. 210-111.000.

J. S. Staedtler: *See*—
Dziuk, Peter, 4,160,256, Cl. 346-140.00A.

Jackes, Stanley F.: *See*—
Morrill, Vaughan, Jr.; and Jackes, Stanley F., 4,160,223, Cl. 335-152.000.

Jackson, Clifford A., to Southland Corporation. Powdered hydrated emulsifiers and their method of preparation. 4,159,952, Cl. 252-356.000.

Jackson, Ian S.: *See*—
Egan, Edward G.; and Jackson, Ian S., 4,159,876, Cl. 356-312.000.

Jackson, Joseph F.: *See*—
Grimwood, Geoffrey L.; and Jackson, Joseph F., 4,159,798, Cl. 233-20.00A.

Jackson, Theodore A.; and Crabtree, James D., to Cadillac Gage Company. Hatch for armored vehicles. 4,159,669, Cl. 89-36.00L.

Jacobson, Carl C.; Manning, Mark C.; and Hill, Francis K., to Crafco, Inc. Materials handling and application mechanism. 4,159,877, Cl. 366-22.000.

Jacobson, Sava W. Telephone earphone amplifier. 4,160,122, Cl. 179-1.00A.

Jacoby, Ian H. Toy projectile launching device. 4,159,705, Cl. 124-63.000.

Jaeger, Frederick T., to Eutectic Corporation. Method of making a composite cast iron dryer or the like. 4,160,048, Cl. 427-142.000.

James, Barry K.; and Terry, David R., to Dresser Industries, Inc. Analogue automatic voltage controller. 4,160,202, Cl. 323-24.000.

Janousek, Rade: *See*—
LaFlaquiere, Regis; and Janousek, Rade, 4,159,620, Cl. 57-301.000.

Janovtchik, Viacheslav J. Steam injectors. 4,160,002, Cl. 261-76.000.

Jason, Alfred C.: *See*—
Hobbs, Geoffrey; Jason, Alfred C.; and Richards, John C. S., 4,160,205, Cl. 324-65.00R.

Jenkins, John C., to TRW Inc. Stud welding apparatus. 4,160,148, Cl. 219-98.000.

Jennings, Richard A., to Bunker Ramo Corporation. High speed multiple event timer. 4,160,154, Cl. 235-92.0EA.

Jervis, John H., Jr. Geometrical instrument. 4,159,571, Cl. 33-403.000.

Jesme, Philip O.; and Calkins, John A., to Smead Manufacturing Company, The. Folder-tang assembly apparatus. 4,159,767, Cl. 206-343.000.

Jette, Edwin L., Jr.: *See*—
Hoddinott, David C.; and Jette, Edwin L., Jr., 4,159,579, Cl. 34-155.000.

Jicha, Jan; Kopecek, Karel; and Langer, Bretislav, to Prvni Brnenska strojirna, narodni podnik. Method for continuously monitoring the clearances in rotating equipment by flow means. 4,159,636, Cl. 73-37.600.

Jo, Tadashi: *See*—
Murakami, Tomoharu; and Jo, Tadashi, 4,159,756, Cl. 188-319.000.

John Wyeth & Brother Limited: *See*—
Curran, Adrian C. W.; Crossley, Roger; and Hill, David G., 4,160,094, Cl. 546-152.000.

Johnson, Arthur R., deceased; by Hudon, Paul A., administrator; and Kesten, Martin, to Preston Engravers, Inc. Adjustable eccentric. 4,159,655, Cl. 74-571.00L.

Johnson, David L.: *See*—
Brown, Robert E.; Johnson, David L.; and Lindquist, John F., 4,159,750, Cl. 180-9.620.

Johnson, Edwin L.: *See*—
Peniston, Quintin P.; and Johnson, Edwin L., 4,159,932, Cl. 204-158.00R.

Johnson, George P. Solar heating apparatus. 4,159,711, Cl. 126-271.000.

Johnson, Owen W.; Miller, Gerald R.; and Beutler, Paul S., to University of Utah. Electrically conductive and corrosion resistant current collector and/or container. 4,160,069, Cl. 429-104.000.

Johnson, Reginald F.; and Sutton, Leonard, to Baker Perkins Holdings Limited. Production of lollipops or like sweets. 4,159,612, Cl. 53-594.000.

Johnston, Laird E.: *See*—
Miller, Larry D.; Johnston, Laird E.; Valus, John T.; and Powell, Thomas M., 4,159,834, Cl. 280-802.000.

Johnston, Samuel A., to Bunker Ramo Corporation. Pressure sensitive switch. 4,160,139, Cl. 200-83.00N.

Jordan, John F.; and Lampkin, Curtis M., to Photon Power, Inc. Photovoltaic cell. 4,159,914, Cl. 136-89.0TF.

Jorgenson, Ronald M., to Acoustical Floors, Inc. Acoustical floor preparation and method. 4,159,912, Cl. 106-109.000.

Jousson, Pierre-Jean: *See*—
Woog, Philippe G. E.; Moret, Michel A.; Jousson, Pierre-Jean; and Musy, Jean-Pierre, 4,159,715, Cl. 128-66.000.

Joyce, Darrell L.; and Kessler, Richard E., to Gachman Steel Company. Stamping machine. 4,159,676, Cl. 101-3.00R.

K-D Manufacturing Company: *See*—
Volk, Richard G., 4,160,203, Cl. 324-15.000.

Kabel-und Metallwerke Gutehoffnungshuette AG: *See*—
Artbauer, Jan, 4,160,119, Cl. 174-28.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Takahashi, Norio, 4,160,176, Cl. 307-362.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, 4,159,890, Cl. 425-59.000.

Kabushiki Kaisha Morita Seisakusho: *See*—
Ota, Sadayasu; and Inoue, Keizo, 4,159,822, Cl. 269-325.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Akahane, Yoshikazu, 4,159,622, Cl. 58-23.0AC.

Kabushiki Kaisha, Toyoda Jidoshokki Seisakusho: *See*—
Takeuchi, Tatsuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,159,616, Cl. 57-83.000.

Kadija, Igor V. Selective plating brush applicator. 4,159,934, Cl. 204-224.00R.

Kajfez, Franjo; Sunjic, Vitomir; and Sunjic, Vesna, to CRC Compagnia di Ricerca Cimica S.A. Process for production of 5-nitroimidazole derivatives. 4,160,096, Cl. 548-338.000.

Kakukawa, Masatoshi; and Kondo, Hideyuki, to Sankyo Kogaku Kogyo Kabushiki Kaisha. Automatic focussing apparatus. 4,160,159, Cl. 250-204.000.

Kakuta, Hiroshi: *See*—
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, 4,159,890, Cl. 425-59.000.

Kalbas, Berthold: *See*—
Kraus, Friedrich; and Kalbas, Berthold, 4,159,728, Cl. 150-2.100.

Kallfelz, Albert J.: *See*—
Brothers, Warren S.; and Kallfelz, Albert J., 4,159,739, Cl. 165-133.000.

Kalmbach, Philip. Sighting device for archery bows. 4,159,575, Cl. 33-265.000.

Kaman Sciences Corporation: *See*—
Holmgren, William A.; Hasling, John S.; and Denny, Richard W., 4,160,204, Cl. 324-207.000.

Kamber, Bruno: *See*—
Rittel, Werner; Brugger, Max; Kamber, Bruno; Riniker, Bernhard; Sieber, Peter; and Greven, Hendrik M., 4,159,981, Cl. 260-112.50T.

Kaminishi, Masashi: *See*—
Ogaki, Koji; Hirosawa, Katsu; Kaminishi, Masashi; Nozawa, Yoshinori; Kakuta, Hiroshi; and Aoki, Akio, 4,159,890, Cl. 425-59.000.

Kaminski, Gerald P. Method for reproducing photographs, drawings, or the like, on marble or granite. 4,159,600, Cl. 51-312.000.

Kang, Byung K.; So, Jin C.; Chung, Tae H.; and Choi, Won. Safety hydraulic brake system for automotive vehicles. 4,159,755, Cl. 188-151.00A.

Kanno, Nobuyuki, to Yamaha Hatsudoki Kabushiki Kaisha. Tricycle. 4,159,752, Cl. 180-210.000.

Karbo, Donald J.; Betts, David A.; and Pauer, Lyle A., to Gould Inc. Abnormal tire condition sensing system. 4,160,234, Cl. 340-58.000.

Karl-Heinz Honsel: *See*—
Honsel, Karl-Heinz; Niehaus, Hans-Rudolf; and Muhlenweg, Karl, 4,159,807, Cl. 242-57.000.

Karl Kroyer St. Anne's Limited: *See*—
Curry, Harold G.; Attwood, Brian W.; White, Derek G. W.; Christensen, John M.; and Kroyer, Karl K. K., 4,160,004, Cl. 264-120.000.

Kasai, Juichi: *See*—
Mieno, Michihiro; Mori, Hideki; Nakanishi, Jun; and Kasai, Juichi, 4,160,116, Cl. 568-867.000.

Kasarauskas, Paul M.: *See*—
Staudinger, Frederick J.; and Kasarauskas, Paul M., 4,159,748, Cl. 177-225.000.

Kashyap, Satish C.; and Wyslouzil, Walter, to Canadian Patents and Development Limited. Single-sided microwave applicator for sealing cartons. 4,160,144, Cl. 219-10.55A.

Kauer, Harald: *See*—
Pietzsch, Ludwig; Kauer, Harald; and Hartmann, Rudolf, 4,159,856, Cl. 305-51.000.

Kauffman, Robert N.: *See*—
Smith, James D. B.; and Kauffman, Robert N., 4,160,178, Cl. 310-43.000.

Kaufman, Barry M., to RFL Industries, Inc. Frequency shift keyed tone generator. 4,160,121, Cl. 178-66.00A.

Kaugars, Girts, to Upjohn Company, The. Compounds, compositions and methods of combatting pest employing thioureas. 4,160,037, Cl. 424-322.000.

Kaul, Pradeep P.; Scholl, Thomas H.; Muzundar, Deepak R.; Wendling, Daniel R.; Buschman, Bob D.; Ikawa, Michio; Miura, Akira; and Love, David A., to Nippon Electric Company, Ltd. Electronic key telephone system. 4,160,131, Cl. 179-99.00M.

Kawamura, Naoto; and Tajima, Akira, to Canon Kabushiki Kaisha. Zoom lens system. 4,159,865, Cl. 350-184.000.

Kayaba K.K.: *See*—
Murakami, Tomoharu; and Jo, Tadashi, 4,159,756, Cl. 188-319.000.

Kayabe Industry Co., Ltd.: *See*—
Masuda, Koji; and Haniuda, Nobuyoshi, 4,159,687, Cl. 112-262.300.

Keiper Automobiltechnik GmbH & Co KG: *See*—
Strowik, Willibald; and Werner, Paul, 4,159,815, Cl. 248-429.000.

Keller, Lynn L.: *See*—
Pueschner, Philip; Holmes, William K.; Thiele, Duane L.; Stearn, Richard A.; Lenius, Norbert W.; and Keller, Lynn L., 4,159,778, Cl. 414-460.000.

Kelly, Charles A.: *See*—
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von Bogdandy, Ludwig; and Kosmider, Hans, 4,159,918, Cl. 148-12.100.

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Kluge, Douglas J., to Diatek, Inc. Cover for temperature sensing probe. 4,159,766, Cl. 206-306.000.

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Akase, Kazutoyo; and Kobayashi, Isao, 4,160,190, Cl. 315-168.000.

Kobayashi, Keigo, to Mitogiken, Ltd. Recording apparatus with intermittent power usage. 4,160,255, Cl. 346-79.000.

Kobayashi, Shinichi: *See*—
Kuroda, Masanobu; Noda, Kazuo; and Kobayashi, Shinichi, 4,159,733, Cl. 164-211.000.

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Dorn, Rainer; Koch, Christian; Reiter, Kurt; and Kunstle, Konrad, 4,159,936, Cl. 208-93.000.

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Kohn, David H.; and Liebersohn, Aharon, to Technion Research and Development Foundation, Ltd. Polymers containing laterally substituted isocyanate groups and their preparation. 4,160,078, Cl. 526-218.000.

Koivunen, Erkki A., to General Motors Corporation. Torque-equalizing means. 4,159,653, Cl. 74-200.000.

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Kollmorgen Technologies Corporation: *See*—
Nuzzi, Francis J.; and Vitellaro, Daniel F., 4,160,050, Cl. 427-304.000.

Komada, Hiroshi; Nakamura, Kuniyasu; and Miyagaki, Ryoichi, to Nihon Soflan Chemical & Engineering Co., Ltd. Polyisocyanate foam having isotropic cells and method and apparatus for preparing same. 4,160,074, Cl. 521-155.000.

Komatsu, Kenji; and Wakamatsu, Teruyoshi, to Meiji Seika Kabushiki Kaisha; and Dai Nippon Insatsu Kabushiki Kaisha. Container having multiple independently unsealable compartments. 4,159,771, Cl. 206-620.000.

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Mabuchi, Kenichi; Tsuchimochi, Yoshihisa; and Komatsu, Koziro, 4,160,253, Cl. 343-225.000.

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Komeno, Taichiro: *See*—
Tsuji, Teruji; Hamashima, Yoshio; Yoshioka, Mitsuru; Narisada, Masayuki; Tanida, Hiroshi; Komeno, Taichiro; and Nagata, Wataru, 4,160,085, Cl. 544-16.000.

Kondo, Hideyuki: *See*—
Kakukawa, Masatoshi; and Kondo, Hideyuki, 4,160,159, Cl. 250-204.000.

Konig, Dieter, to Steigerwald Strahltechnik GmbH. Method and apparatus for energy beam welding. 4,160,150, Cl. 219-121.0EB.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fujiwhara, Mitsuto; Sasaki, Takashi; and Uchida, Takashi, 4,159,910, Cl. 96-74.000.

Konrad, John: *See*—
Ficker, Herman; and Konrad, John, 4,159,802, Cl. 237-8.00R.

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Jicha, Jan; Kopecek, Karel; and Langer, Bretislav, 4,159,636, Cl. 73-37.600.

Korr, Abraham L.; Walker, Evan H.; and Svihel, Bernard T., to A. L. Korr Associates, Inc. Apparatus for the collection and conversion of solar energy. 4,159,629, Cl. 60-641.000.

Kos, Joseph M.: *See*—
Harner, Kermit I.; Kos, Joseph M.; and Patrick, John P., 4,160,170, Cl. 290-44.000.

Koski, William E.: *See*—
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,160,054, Cl. 424-48.000.

Kosmider, Hans: *See*—
von Bogdandy, Ludwig; and Kosmider, Hans, 4,159,918, Cl. 148-12.100.

Kotlarski, Joseph R., to Hughes Aircraft Company. Analogue storage and processing system. 4,160,249, Cl. 343-9.000.

Kovac, Michael G., to RCA Corporation. CCD electrode and channel structure for 180° turn. 4,160,262, Cl. 357-24.000.

Kovacs, Lloyd; and Hart, Charles G., to Hayssen Manufacturing Company. Method of and apparatus for feeding randomly received items. 4,159,760, Cl. 198-419.000.

Kovatchev, Stephen: *See*—
Eibl, Hansjorg; Diembeck, Walter; and Kovatchev, Stephen, 4,159,988, Cl. 260-340.90R.

Kowalski, Gunter: *See*—
Weiss, Hermann; and Kowalski, Gunter, 4,160,167, Cl. 250-445.00T.

Koy, Johannes: *See*—
Scheffels, Wilhelm; and Koy, Johannes, 4,160,149, Cl. 219-121.0EM.

Koyama, Teruo: *See*—
Tanaka, Tadashi; Obi, Tatsuro; Arai, Nobuichi; and Koyama, Teruo, 4,160,056, Cl. 428-220.000.

Kozuka, Mikio; Ono, Isao; and Fukuwatari, Takashi, to Asahi Glass Company, Ltd. Method of molding cementitious material. 4,160,003, Cl. 264-87.000.

Kraemer, Robert H. O.: *See*—
Laughlin, James P., Jr.; Loessel, Mark C.; and Kraemer, Robert H. O., 4,160,247, Cl. 340-693.000.

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Dorn, Rainer; Koch, Christian; Reiter, Kurt; and Kunstle, Konrad, 4,159,936, Cl. 208-93.000.

Kramer, Pieter; Compaan, Klaas; and Forsthuber, Robert F. K., to U.S. Philips Corporation. Apparatus for optically reading a phase-modulated optical record carrier. 4,160,269, Cl. 358-128.000.

Kraus, Friedrich; and Kalbas, Berthold, to Gummi-Kraus GmbH. Hot water bag. 4,159,728, Cl. 150-2.100.

Krause, Manfred: *See*—
Lemke, Otto; and Krause, Manfred, 4,159,924, Cl. 202-142.000.

Kravitz, Stanley: *See*—
Estes, John H.; Kravitz, Stanley; and Suggitt, Robert M., 4,160,011, Cl. 423-328.000.

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Schreyer, Gerd; Wirthwein, Rolf; Reissinger, Karl-Hermann; and Krekel, Jorg, 4,159,925, Cl. 203-28.000.

Krekeler, Hans: *See*—
Muller, Werner H.; Riedel, Knut; and Krekeler, Hans, 4,160,113, Cl. 568-772.000.

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Margalit, Nehemiah; and Krouse, Philip E., 4,160,070, Cl. 429-194.000.

Kroyer, Karl K. K.: *See*—
Curry, Harold G.; Attwood, Brian W.; White, Derek G. W.; Christensen, John M.; and Kroyer, Karl K. K., 4,160,004, Cl. 264-120.000.

Krueger Metal Products, Inc.: *See*—
Tolleson, Thomas H., 4,159,846, Cl. 297-162.000.

Kruger, Josef: *See*—
Patzner, Alfred; and Kruger, Josef, 4,160,006, Cl. 264-292.000.

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Sprecker, Mark A.; Kryschuk, John J.; and Hall, John B., 4,159,987, Cl. 260-340.90R.

Krysiak, Brian T.; Kunevicius, James M.; and Leslie, Bruce C., to Lof Plastics Inc. Corner for decorative and protective molding strip. 4,160,052, Cl. 428-31.000.

Kummer, Joseph T., to Ford Motor Company. Storage battery. 4,160,068, Cl. 429-82.000.

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Kunisawa, Masuo: *See*—
Atoji, Hitomi; Kunisawa, Masuo; Shimooka, Riyo; and Okazaki, Seiji, 4,160,280, Cl. 358-294.000.

Kunstle, Konrad: *See*—
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Kuny, Wilhelm, to Siemens Aktiengesellschaft. Transducer electrodes for filters or delay lines utilizing surface wave principles. 4,160,219, Cl. 333-151.000.

Kurihara, Tetsuro, to Tokyo Shibaura Electric Co., Ltd. X-ray television apparatus. 4,160,266, Cl. 358-111.000.

Kuroda, Masanobu; Noda, Kazuo; and Kobayashi, Shinichi, to Hitachi Metals, Ltd. Molding machine. 4,159,733, Cl. 164-211.000.

Kusano, Nobuo: *See*—
Shigeyasu, Motoo; and Kusano, Nobuo, 4,160,108, Cl. 562-416.000.

Kusters, John A.; Leach, Jerry G.; and Fischer, Michael C., to Hewlett-Packard Company. Oscillator having a quartz resonator cut to compensate for static and dynamic thermal transients. 4,160,183, Cl. 310-315.000.

Kvita, Vratislav; Darms, Roland; and Greber, Gerd, to Ciba-Geigy Corporation. Imidyl- and isoimidyl-phthalic anhydrides, process for their manufacture and their use for curing epoxide resins. 4,160,081, Cl. 528-93.000.

LaFlaquiere, Regis; and Janousek, Rade, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Yarn-piecing and cleaning system for a spinning machine. 4,159,620, Cl. 57-301.000.

Lagasse, Alain: *See*—
Violland, Robert; and Lagasse, Alain, 4,159,978, Cl. 525-441.000.

Laitram Corporation, The: *See*—
Kewley, Monte L.; and Demarest, LeRoy E., 4,159,763, Cl. 198-853.000.

Lally, Robert E.: *See*—
Hoch, Samuel; Lally, Robert E.; and Ceprini, Mario Q., 4,159,973, Cl. 260-23.0XA.

Lamb, Raymond K.; and Walker, Stephen J., to Baylor College of Medicine. Hydraulic test tool and method. 4,159,637, Cl. 73-46.000.

Lampkin, Curtis M.: *See*—
Jordan, John F.; and Lampkin, Curtis M., 4,159,914, Cl. 136-89.0TF.

Langen, Marinus J. M., to H. J. Langen & Sons Ltd. Closure mechanism for closing end of loaded cartons. 4,159,610, Cl. 53-525.000.

Langer, Bretislav: *See*—
Jicha, Jan; Kopecek, Karel; and Langer, Bretislav, 4,159,636, Cl. 73-37.600.

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Peters, Werner; Langhoff, Josef; Henkel, Siegfried; and Haverkamp, Klaus D., 4,159,905, Cl. 75-42.000.

Larkin, John M.: *See*—
Love, Richard F.; Newman, Stanley R.; and Larkin, John M., 4,159,996, Cl. 260-570.50P.

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Berenbaum, Marvin, 4,159,698, Cl. 123-41.310.

Latimer, William R.: *See*—
Clement, Ralph C.; and Latimer, William R., 4,160,137, Cl. 200-42.00T.

Laughlin, James P., Jr.; Loessel, Mark C.; and Kraemer, Robert H. O., to Whirlpool Corporation. Means for housing an electrical control. 4,160,247, Cl. 340-693.000.

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Uchida, Isamu; Watanabe, Kenkichi; and Furuya, Katusuke, 4,159,607, Cl. 53-64.000.

Lauria, Francesco: *See*—
Doria, Gianfederico; Romeo, Ciriaco; Corno, Maria L.; Lauria, Francesco; Sberze, Piero; and Tibolla, Marcellino, 4,160,028, Cl. 424-248.510.

Law, Wendell A., to Sperry Rand Corporation. Multiple dial adapter. 4,160,124, Cl. 179-2.0DP.

Layton, Guy V., Jr. Cuspidor. 4,159,549, Cl. 4-285.000.

Lazarchik, Robert E.; and Roeder, Robert S., to Sperry Rand Corporation. Hybrid dual mode radiometric system. 4,160,251, Cl. 343-100.0ME.

Leach, Jerry G.: *See*—
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Rea, Irvin B.; and Telmet, Juhan, 4,160,132, Cl. 179-114.00R.

Lee, Hsing-San; Pricer, Wilbur D.; and Vogl, Norbert G., Jr., to International Business Machines Corporation. Accessing arrangement for memories with small cells. 4,160,275, Cl. 365-149.000.

Lee, Ki S. Perfumed vapor dispensing jewelry. 4,159,631, Cl. 63-1.00R.

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Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., 4,160,090, Cl. 544-164.000.

Legg, Howard W. Solar energy conversion unit. 4,159,712, Cl. 126-271.000.

Leja, Ronald J.; and Williams, Hugh K., to Allis-Chalmers Corporation. Vehicle protective frame with internal reinforcing members. 4,159,835, Cl. 280-756.000.

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Clemence, Francois; and Le Martret, Odile, 4,159,986, Cl. 260-332.20A.

Lemke, Otto; and Krause, Manfred, to Carl Still Recklinghausen, Firma. Combined control device for the operation of coke oven batteries to effect switching of the regenerative heating system from one group of flues to another and for converting from one heating gas to another. 4,159,924, Cl. 202-142.000.

Lenius, Norbert W.: *See*—
Pueschner, Philip; Holmes, William K.; Thiele, Duane L.; Stearn, Richard A.; Lenius, Norbert W.; and Keller, Lynn L., 4,159,778, Cl. 414-460.000.

Lerer, Michael I.: *See*—
Sanders, Royden C., Jr.; Lerer, Michael I.; and Conant, John P., 4,159,882, Cl. 400-124.000.

Les Produits Associes LPA S.A.: *See*—
Woog, Philippe G. E.; Moret, Michel A.; Jousson, Pierre-Jean; and Musy, Jean-Pierre, 4,159,715, Cl. 128-66.000.

Leslie, Bruce C.: *See*—
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Levek, Robert P.; Mamuzic, Rastko I.; and Sands, John L., to Great Lakes Chemical Corporation. Process for the isolation of pentabromophenol. 4,160,112, Cl. 568-755.000.

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Lewis, William B., to Exxon Research & Engineering Co. Start-up procedure for reforming with platinum-iridium catalysts. 4,159,938, Cl. 208-139.000.

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Krumrein, Gerhard, 4,160,235, Cl. 340-81.00R.

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Lichtenberg, Edward. Device for instruction in the game of bridge and method of and device for dealing predetermined bridge hands. 4,159,581, Cl. 35-8.00B.

Liebersohn, Aharon: *See*—
Kohn, David H.; and Liebersohn, Aharon, 4,160,078, Cl. 526-218.000.

Lindquist, John F.: *See*—
Brown, Robert E.; Johnson, David L.; and Lindquist, John F., 4,159,750, Cl. 180-9.620.

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Etienne, Patrick; Massies, Jean; and Linh, Nguyen T., 4,160,166, Cl. 250-423.00R.

Linne, Robert S., to Southwire Company. Metallic rod product, and method for producing same. 4,159,633, Cl. 72-198.000.

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Ljung, Bo H. G., to Singer Company, The. Piezoelectric actuator for a ring laser. 4,160,184, Cl. 310-328.000.

Lloyd-Lucas, Christopher: *See*—
Lloyd-Lucas, John B.; and Lloyd-Lucas, Christopher, 4,160,073, Cl. 521-122.000.

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Lobbe, Armin; and Steinkuhl, Bernd, to Gewerkschaft Eisenhutte Westfalia. Mineral mining installation with face end winning. 4,159,850, Cl. 299-34.000.

Loctite Corporation: *See*—
Moran, James P., Jr., 4,159,976, Cl. 260-33.4EP.

Lodzinski, Fred P.: *See*—
Dearth, Leonard R.; and Lodzinski, Fred P., 4,159,874, Cl. 356-73.000.

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Loewrigkeit, Peter; Van Dyk, Kenneth A.; and McGimpsey, Thomas T., to Witco Chemical Corporation. Polyurethane latexes from NCO prepolymers chain extended with polyepoxides, polyanhydrides or polyaldehydes, and layered products. 4,160,065, Cl. 428-425.000.

Lof Plastics Inc.: *See*—
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Longshore, Randolph E., to United States of America, Army. Method for producing a scabrous photosensitive surface. 4,160,045, Cl. 427-38.000.

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Leveque, Jean-Luc; Gras, Gilbert; and Scot, Jean, 4,159,640, Cl. 73-81.000.

Losenno, Luigi G. Beautician's tool hanger. 4,159,773, Cl. 211-60.00T.

Love, David A.: *See—*
Kaul, Pradeep P.; Scholl, Thomas H.; Muzundar, Deepak R.; Wendling, Daniel R.; Buschman, Bob D.; Ikawa, Michio; Miura, Akira; and Love, David A., 4,160,131, Cl. 179-99.00M.

Love, Richard F.; Newman, Stanley R.; and Larkin, John M., to Texaco Inc. Preparation of alkane diamines. 4,159,996, Cl. 260-570.50P.

Luber, Edward J., Jr.: *See—*
Warner, Paul L., Jr.; and Luber, Edward J., Jr., 4,160,097, Cl. 548-346.000.

Luca, Sebastiano F.; Thommel, Jurgen; and Bronn, Walter K., to Versuchsanstalt der Hefeindustrie e.V. Freely-flowing powdered fresh baker's yeast preparation and method of producing it. 4,160,040, Cl. 426-62.000.

Lucas, David A.; and Vincent, Richard P., to U.S. Philips Corporation. Method of determining the direction of a radio source and radio interferometer system. 4,160,252, Cl. 343-113.00R.

Lucas Industries Limited: *See—*
Allport, Maurice J.; and Cotton, Herbert J. T., 4,160,179, Cl. 310-68.00R.

Luepertz, Hans-Henning: *See—*
Oberthuer, Heinrich; Burgdorf, Jochen; and Luepertz, Hans-Henning, 4,159,853, Cl. 303-6.00C.

Luther, Hans-Werner; and Bender, Peter, to Rheinmetall G.m.b.H. Propellant charge casing. 4,159,678, Cl. 102-44.000.

M & W Gear Company: *See—*
Meiners, Elmo R., 4,159,833, Cl. 280-478.00R.

M-W Handicapped Enterprises, Inc.: *See—*
Manning, Willie D.; and Whitehead, Jerry, 4,159,545, Cl. 3-12.800.

Mabuchi, Kenichi; Tsuchimochi, Yoshihisa; and Komatsu, Koziro, to Mabuchi Motor Co. Ltd. Radio controlled, battery-operated model toy. 4,160,253, Cl. 343-225.000.

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Mabuchi, Kenichi; Tsuchimochi, Yoshihisa; and Komatsu, Koziro, 4,160,253, Cl. 343-225.000.

MacPhee, John, to Baldwin-Gegenheimer Corporation. Flexure positioning mechanism. 4,159,651, Cl. 74-55.000.

Madsen, Byron K.: *See—*
Simms, Romilly J.; and Madsen, Byron K., 4,159,639, Cl. 73-63.000.

Maes, Robert H.; and Fontainas, Luc M., to Metallurgie Hoboken-Overpelt. Process for extracting bismuth from a bismuth-bearing material. 4,159,904, Cl. 75-10.00R.

Magistro, Angelo J.: *See—*
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Maguire, Roy L., to Caterpillar Tractor Co. Weld testing apparatus. 4,159,650, Cl. 73-847.000.

Mahdjuri, Faramarz, to U.S. Philips Corporation. Solar collector comprising an evacuated absorber cover tube. 4,159,706, Cl. 126-270.000.

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Russell, Robert J., 4,159,611, Cl. 53-569.000.

Malherbaud, Jacques: *See—*
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Levek, Robert P.; Mamuzic, Rastko I.; and Sands, John L., 4,160,112, Cl. 568-755.000.

Manis, Charles A.; and Overcash, Gary B., to Packaging Corporation of America. Foldable device for supporting a reel. 4,159,768, Cl. 206-396.000.

Manning, Mark C.: *See—*
Jacobson, Carl C.; Manning, Mark C.; and Hill, Francis K., 4,159,877, Cl. 366-22.000.

Manning, Willie D.; and Whitehead, Jerry, to M-W Handicapped Enterprises, Inc. Working artificial hand combination. 4,159,545, Cl. 3-12.800.

Manufacture Belge d'Aiguilles S.A.: *See—*
Heim, Helmut, 4,159,686, Cl. 112-222.000.

Manz, David F.; Irwin, Clarence C.; and Salamon, Theodore M., to General Motors Corporation. Linear locking seat belt retractor. 4,159,848, Cl. 297-474.000.

Marchetti, Charles R.; and Mason, Marvin S., to GTE Sylvania Incorporated. Essential user bypass circuit for telephone switching system. 4,160,130, Cl. 179-18.0EA.

Margalit, Nehemiah; and Krouse, Philip E., to ESB United States, Inc. Additive for high drain rate lithium cells. 4,160,070, Cl. 429-194.000.

Marianowski, Leonard G.: *See—*
Camara, Elias H.; Marianowski, Leonard G.; and Donado, Rafael A., 4,160,067, Cl. 429-16.000.

Marinelli, Donald P., to RCA Corporation. Apparatus for depositing epitaxial semiconductor from the liquid phase. 4,159,694, Cl. 118-401.000.

Mark, Victor; and Wilson, Phillip S., to General Electric Company. Plasticized polycarbonate composition. 4,159,974, Cl. 260-30.200.

Marlowe, Frank J.; and Dawson, Robert H., to RCA Corporation. Digital memory addressing system. 4,160,273, Cl. 364-900.000.

Marlowe, Frank J.: *See—*
Anderson, Charles H.; and Marlowe, Frank J., 4,160,194, Cl. 315-366.000.

Marondel, Gisela M., executrix: *See—*
Gawlick, Heinz; Homburg, Axel; Siegelin, Werner; and Marondel, Gunther, deceased, 4,160,062, Cl. 428-365.000.

Marondel, Gunther, deceased: *See—*
Gawlick, Heinz; Homburg, Axel; Siegelin, Werner; and Marondel, Gunther, deceased, 4,160,062, Cl. 428-365.000.

Martin, Harlan W., to Favorite Manufacturing, Inc. Egg collector. 4,159,696, Cl. 119-48.000.

Martin Marietta Corporation: *See—*
Thomas, Frank J.; Gay, Donald L.; and Winsor, Chester A., 4,160,272, Cl. 364-602.000.

Martin, Stephen M.; and Miller, Ralph P., to Fairchild Camera and Instrument Corp. Wireless multi-head smoke detector system. 4,160,246, Cl. 340-630.000.

Marvin Glass & Associates: *See—*
Terzian, Rouben T.; and Meyer, Burton C., 4,159,665, Cl. 84-404.000.

Mason, Marvin S.: *See—*
Bojanek, Robert J.; and Mason, Marvin S., 4,160,126, Cl. 179-15.0AT.
Marchetti, Charles R.; and Mason, Marvin S., 4,160,130, Cl. 179-18.0EA.

Massey, James V., III: *See—*
Levine, Robert A.; and Wardlaw, Stephen C., 4,159,896, Cl. 23-230.00B.

Massies, Jean: *See—*
Etienne, Patrick; Massies, Jean; and Linh, Nguyen T., 4,160,166, Cl. 250-423.00R.

Mastronardi, Enrico M. Keyboard assembly for an accordion. 4,159,664, Cl. 84-376.00R.

Masuda, Koji; and Haniuda, Nobuyoshi, to Kayabe Industry Co., Ltd. Automatic guiding method for workpiece in sewing machine. 4,159,687, Cl. 112-262.300.

Masuda, Sinzo; and Okochi, Tsuneyuki, to Package Engineering Corporation. Bottling machine. 4,159,608, Cl. 53-282.000.

Masumoto, Kazuhiro: *See—*
Yagi, Kazuo; and Masumoto, Kazuhiro, 4,159,889, Cl. 425-71.000.

Matrapa S.A.: *See—*
Polack, Andre M., 4,159,602, Cl. 52-79.900.

Matrix Toys, Inc.: *See—*
Gabriel, Richard J., 4,159,592, Cl. 46-26.000.

Matsubara, Soichi; Niikawa, Ryo; and Numata, Morikuni, to Honda Giken Kogyo Kabushiki Kaisha. Multi-spot welding apparatus. 4,160,147, Cl. 219-87.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, 4,160,014, Cl. 423-644.000.

Matsuyama Petrochemicals Inc.: *See—*
Shigeyasu, Motoo; and Kusano, Nobuo, 4,160,108, Cl. 562-416.000.

Maul, Peter L.: *See—*
Hughes, John; and Maul, Peter L., 4,159,683, Cl. 110-343.000.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Eibl, Hansjorg; Diembeck, Walter; and Kovatchev, Stephen, 4,159,988, Cl. 260-340.90R.

Mayer, Endre A., to Bendix Corporation, The. Air assisted fuel atomizer. 4,159,703, Cl. 123-139.0AW.

Mayercheck, William D.: *See—*
Kleysteuber, William K.; and Mayercheck, William D., 4,159,757, Cl. 198-303.000.

Mayne, William H.; Hawes, William S.; and Badger, Algernon S., to Geosource Inc. Seismic array. 4,160,233, Cl. 340-15.5MC.

McAllise, Raymond J. Delayed turn-off switching circuit. 4,160,192, Cl. 315-194.000.

McCombs, Allan K.; and Stein, Jay A., to American Science and Engineering, Inc. X-ray detecting system having negative feedback for gain stabilization. 4,160,165, Cl. 250-354.000.

McConnell, Kenneth G.: *See—*
Greer, Raymond T.; McConnell, Kenneth G.; and Akers, Arthur, 4,159,942, Cl. 209-143.000.

McCormack, Neil Charles: *See—*
Hodkinson, Trevor, 4,159,810, Cl. 242-198.000.

McCrum, William H. Compound engines. 4,159,699, Cl. 123-59.0EC.

McCrum, William H. Internal combustion compound engines. 4,159,700, Cl. 123-59.0EC.

McCullough, Gail A.: *See—*
Allington, William B., deceased; Nelson, James W.; Cordry, Arthur L.; McCullough, Gail A.; and Mitchell, Don E., 4,159,933, Cl. 204-180.00R.

McDonie, Arthur F.: *See—*
Tomasetti, Charles M.; and McDonie, Arthur F., 4,160,185, Cl. 313-94.000.

McFee, James H.; and Miller, Barry I., to Bell Telephone Laboratories, Incorporated. Molecular beam epitaxy using premixing. 4,159,919, Cl. 148-175.000.

McGimpsey, Thomas T.: *See—*
Loewrigkeit, Peter; Van Dyk, Kenneth A.; and McGimpsey, Thomas T., 4,160,065, Cl. 428-425.000.

McGough, Gerald B., to GTE Automatic Electric Laboratories Incorporated. Anti-vandalism arrangement for protecting the touch calling unit of a coin telephone. 4,160,136, Cl. 179-184.000.

McGough, Ronald B., to Honeywell Inc. Concentric tube hydrophone streamer. 4,160,229, Cl. 340-7.00R.

McKendrick, Thomas E.: *See—*
Buckley, James E.; McKendrick, Thomas E.; North, Lee E.; and Mendelsohn, Nathan, 4,159,660, Cl. 82-3.000.

McLean, Andrew I. O.: *See—*
Steele, David J.; McLean, Andrew I. O.; and Anderson, Martin B., 4,160,155, Cl. 235-92.0TC.

McMahon, Donald H., to Sperry Rand Corporation. Optical reader for multiline image processing. 4,160,237, Cl. 340-146.30F.

McMillon, David A.: *See—*
Brooks, Larry L.; and McMillon, David A., 4,159,947, Cl. 210-108.000.

McReynolds, William W. Automotive step-turbine engine. 4,159,623, Cl. 60-39.150.

Mead Corporation, The: *See—*
Calvert, Rodney K., 4,159,841, Cl. 294-87.200.
Dick, Lloyd C., 4,159,887, Cl. 414-786.000.

Mechanikai Laboratorium Hiradastechnikai Kiserleti Vallalat: *See—*
Rothman, Gyorgy; Babos, Gyorgy; Gyarmati nee Hardik, Maria; Hegedus, Arpad; and Rofa, Otto, 4,160,197, Cl. 318-396.000.

Meichsner, Walter; Rock, Heinrich; Freissmuth, Alfred; Prietzel, Horst; Rellermeyer, Heinrich; Ullrich, Wolfgang; Pfluger, Erich; and Sindermann, Raymund, to Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft. Method and composition for the desulfurization of molten metals. 4,159,906, Cl. 75-58.000.

Meier, Werner: *See—*
Weckenmann, Albert; Wesemeyer, Jurgen; Haubner, Georg; Meier, Werner; and Zobl, Hartmut, 4,160,238, Cl. 340-147.00R.

Meihofer, Edward F., to Butler Automatic, Inc. Variable ratio winder. 4,159,808, Cl. 242-75.510.

Meiji Seika Kabushiki Kaisha: *See—*
Komatsu, Kenji; and Wakamatsu, Teruyoshi, 4,159,771, Cl. 206-620.000.

Meiji Seika Kaisha, Ltd.: *See—*
Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Watanabe, Hiroshi; Kojima, Michio; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Shingo, 4,160,026, Cl. 424-116.000.

Meiners, Elmo R., to M & W Gear Company. Wide range bumper mounted hitch with shock absorber attachment for tow vehicle. 4,159,833, Cl. 280-478.00R.

Melander, Theodore A., to Pako Corporation. Duty cycle shared proportional temperature control. 4,160,153, Cl. 219-485.000.

Melcher, Robert J.: *See—*
Funck, Gordon W.; and Melcher, Robert J., 4,159,862, Cl. 339-186.00M.

Mendelsohn, Nathan: *See—*
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Meng, Karl: *See—*
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Merck & Co., Inc.: *See—*
Cole, Lucille J., 4,160,083, Cl. 536-17.00A.
Duyfjes, Werner, 4,160,029, Cl. 424-258.000.
Miller, Thomas W.; Wilson, Kenneth E.; and Ormond, Robert E., 4,160,084, Cl. 536-17.00A.
Remy, David C., 4,160,031, Cl. 424-267.000.

Merrick, Larry H., to Harco Corporation. Method and apparatus for determining the reference voltage in an impressed current corrosion protection system. 4,160,171, Cl. 307-95.000.

Merritt, William H., to Plastics Engineering & Manufacturing Co. Luminaire shield. 4,160,286, Cl. 362-311.000.

Metal Awning Components, Inc.: *See—*
Weiner, Carl B., 4,159,844, Cl. 296-37.100.

Metallurgie Hoboken-Overpelt: *See—*
Maes, Robert H.; and Fontainas, Luc M., 4,159,904, Cl. 75-10.00R.

Mette, Manfred, to Ortmann & Herbst GmbH. Liquid filling device with automatic shut-off sensor. 4,159,726, Cl. 141-40.000.

Mettler Instrument AG: *See—*
Realini, Enrico, 4,159,747, Cl. 177-210.0EM.

Meyer, Burton C.: *See—*
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Microdot Inc.: *See—*
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Microlife Technics, Inc.: *See—*
Groben, Richard L.; Gryczka, Alfred J.; and Franklin, Alfred A., 4,160,038, Cl. 426-53.000.

Mieno, Michihiro; Mori, Hideki; Nakanishi, Jun; and Kasai, Juichi, to Showa Denko K.K. Process for the production of alkylene glycols. 4,160,116, Cl. 568-867.000.

Mikite, Gyula: *See—*
Levai, Laszlo; Mikite, Gyula; and Kis-Tamas, Attila, 4,160,035, Cl. 424-311.000.

Miles Laboratories, Inc.: *See—*
Fenocketti, Leonard P.; and Rapkin, Myron C., 4,160,008, Cl. 422-56.000.
Kluender, Harold C., 4,159,998, Cl. 260-586.00R.

Miles, Peter: *See—*
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Miller, Anthony D., to Tomy Corporation. Game employing movement to control the operation of the game. 4,159,593, Cl. 46-42.000.

Miller, Barry I.: *See—*
McFee, James H.; and Miller, Barry I., 4,159,919, Cl. 148-175.000.

Miller, Gerald R.: *See—*
Johnson, Owen W.; Miller, Gerald R.; and Beutler, Paul S., 4,160,069, Cl. 429-104.000.

Miller, Larry D.; Johnston, Laird E.; Valus, John T.; and Powell, Thomas M., to General Motors Corporation. Passive lap and shoulder belt system. 4,159,834, Cl. 280-802.000.

Miller, Ralph P.: *See—*
Martin, Stephen M.; and Miller, Ralph P., 4,160,246, Cl. 340-630.000.

Miller, Robert F.: *See—*
Szumachowski, Edwin R.; and Miller, Robert F., 4,160,066, Cl. 428-683.000.

Miller, Thomas W.; Wilson, Kenneth E.; and Ormond, Robert E., to Merck & Co., Inc. Method for the separation of antibiotic macrolides. 4,160,084, Cl. 536-17.00A.

Million, William A.; Plews, Rhona M.; and Richardson, Kenneth, to Pfizer Inc. Intermediates for aminoglycoside antibiotics. 4,160,082, Cl. 536-10.000.

Minolta Camera Kabushiki Kaisha: *See—*
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Yasukuni, Mitsuo; Iida, Takashi; and Kiten, Hiroshi, 4,159,864, Cl. 350-184.000.

Miquel, Jean-Francois, to Agence Nationale de Valorisation de la Recherche. Solar energy collector and installation employing same. 4,159,707, Cl. 126-270.000.

Mirsagatov, Mirmakhmud A.: *See—*
Ismatkhodzhaev, Sagdulla K.; Usmanov, Salikh Z.; Mirsagatov, Mirmakhmud A.; Dzhabarov, Nasim G.; Takhirdzhanov, Makhirdzhan; and Mumindzhanov, Anvardzhan F., 4,160,196, Cl. 318-749.000.

Miserlis, Constantine D., to Badger Company, Inc., The. Removal of plastic polymer fines from tallow. 4,159,992, Cl. 260-412.600.

MistO_2Gen Equipment Company: *See—*
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Mitchell, Don E.: *See—*
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Mitogiken, Ltd.: *See—*
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Mitsui Aluminium Co., Ltd.: *See—*
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Mitsui Mfg. Co., Ltd.: *See—*
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Mitsui Petrochemical Industries, Inc.: *See—*
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Mitsui, Yoshiaki, to Mitsui Mfg. Co., Ltd. Laminated core manufacture. 4,160,182, Cl. 310-214.000.

Miura, Akira: *See—*
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Miyagaki, Ryoichi: *See—*
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Miyamae, Toshiaki. Collapsible universal fishing rod holding apparatus. 4,159,816, Cl. 248-515.000.

Miyatake, Hideaki: *See—*
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Mizell, Louis R., to I.W.S. Nominee Company Limited. Cleaning pad. 4,159,883, Cl. 401-201.000.

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Mobil Oil Corporation: *See—*
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Frangatos, Gerassimos, 4,159,960, Cl. 252-49.900.
Haag, Werner O.; and Huang, Tracy J., 4,159,995, Cl. 260-450.000.

Moldex Limited: *See—*
Hewson, Clifford B., 4,159,548, Cl. 4-236.000.

Molinari, Thomas E., to RCA Corporation. Printed circuit impedance transformation network with an integral spark gap. 4,160,210, Cl. 325-362.000.

Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, to Bayer Aktiengesellschaft. Pyrazole derivatives. 4,160,098, Cl. 548-374.000.

Monch, Werner; and Ziemer, Walter, to Motoren-Werk Mannheim AG vorm. Benz Abt. Stat. Motorenbau. Exhaust pipe for an internal combustion engine. 4,159,627, Cl. 60-322.000.

Mone, Rudolf A. J.; and Klaver, Gijsbertus, to Akzona Incorporated. Process for the preparation of agglomerates of porous aluminum oxide. 4,159,969, Cl. 252-463.000.

Monitek, Inc.: *See—*
Cushing, Vincent J., 4,159,645, Cl. 73-194.0EM.

Monsanto Company: *See—*
Beestman, George B.; and Prill, Erhard J., 4,159,901, Cl. 71-86.000.

Monte, Anthony J.; and Wahoski, Ernest C. Fire extinguishant mechanism. 4,159,744, Cl. 169-26.000.

Montedison S.p.A.: *See—*
Agnes, Giovanni; Bimbi, Giuseppe; Guerrieri, Franco; and Rucci, Guglielmo, 4,160,107, Cl. 560-204.000.

Montgomery, Warren G. Continuous mining machine with improved cutter head slide means. 4,159,852, Cl. 299-56.000.

Moore, Randolph G.: *See—*
Butler, Walker; and Moore, Randolph G., 4,160,250, Cl. 343-9.00R.
Moran, James P., Jr., to Loctite Corporation. Curable systems containing epoxy resin and methanol or ethanol solvent to suppress the catalytic reaction between epoxy resin and an imidazole catalytic curing agent. 4,159,976, Cl. 260-33.4EP.
Moret, Michel A.: *See—*
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Morex, Inc.: *See—*
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Mori, Takao: *See—*
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Morita Hardware Manufacturing, Inc.: *See—*
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Morita, Hideo: *See—*
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Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; and Tsuyama, Shigeo, 4,159,965, Cl. 252-429.00B.
Morita, Mike Y., to Morita Hardware Manufacturing, Inc. Combination door stop and latching device. 4,159,837, Cl. 292-127.000.
Moriwaki, Yoshio: *See—*
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Moriya, Takao; Yamasawa, Masao; and Gambe, Hirohisa, to Fujitsu Limited. Asynchronous reversible analog to digital converter. 4,160,243, Cl. 340-347.00C.
Morrill, Vaughan, Jr.; and Jackes, Stanley F., to Morex, Inc. Plural reed switches having an integral, interconnecting web. 4,160,223, Cl. 335-152.000.
Morton-Norwich Products, Inc.: *See—*
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Motoren-Werk Mannheim AG vorm. Benz Abt. Stat. Motorenbau: *See—*
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Motorola, Inc.: *See—*
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Partipilo, Phillip, 4,160,240, Cl. 340-311.000.
Wilson, Richard W., 4,159,909, Cl. 75-170.000.
Moulin, Michel: *See—*
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Muller, Karl-Heinz; and Rindfleisch, Volker, to Siemens Aktiengesellschaft. Method for the pictorial display of a diffraction image in a transmission-type, scanning, corpuscular-beam microscope. 4,160,162, Cl. 250-311.000.
Muller, Werner H.; Riedel, Knut; and Krekeler, Hans, to Hoechst Aktiengesellschaft. Process for the manufacture of resorcinol. 4,160,113, Cl. 568-772.000.
Mumindzhanov, Anvardzhan F.: *See—*
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Mundel, Gunter; and Poutet, Jean-Claude, to Ed. Zublin Aktiengesellschaft. Method for making reinforcing baskets for steel reinforced hollow concrete bodies. 4,160,146, Cl. 219-58.000.
Murakami, Tomoharu; and Jo, Tadashi, to Kayaba K.K. Adjusting device for damping force of rear shock-absorbers of motorcycles. 4,159,756, Cl. 188-319.000.
Muranaka, Tsutomu: *See—*
Ohara, Isamu; Muranaka, Tsutomu; and Eizumi, Hideo, 4,160,221, Cl. 335-68.000.
Murata, Chigaku, to Toyota Jidosha Kogyo Kabushiki Kaisha. System for controlling fuel supply in internal combustion engine. 4,159,701, Cl. 123-97.00B.
Murphy, Donald W.: *See—*
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Musy, Jean-Pierre: *See—*
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N L Industries, Inc.: *See—*
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Nadj, Henriette: *See—*
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Nakauchi, Shunsaku, to Security Patrols Co., Ltd. Flame sensing system. 4,160,163, Cl. 250-339.000.
Nakauchi, Shunsaku, to Security Patrols Co., Ltd. Flame sensing system. 4,160,164, Cl. 250-339.000.
Nalco Chemical Company: *See—*
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Narcus, Harold. Bright electroless plating process producing two-layer nickel coatings on dielectric substrates. 4,160,049, Cl. 427-277.000.
Narisada, Masayuki: *See—*
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National Research Development Corporation: *See—*
Hobbs, Geoffrey; Jason, Alfred C.; and Richards, John C. S., 4,160,205, Cl. 324-65.00R.
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NCR Corporation: *See—*
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Nelson, James W.: *See—*
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Nelson, Ronald C., to Zenith Radio Corporation. Fine tuning indicator for TV with synchronous detector. 4,160,278, Cl. 358-192.000.
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Newman, August B. Paste applicator. 4,159,695, Cl. 118-413.000.
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Niemela, W. Wally. Push bumper. 4,159,584, Cl. 37-44.000.
Nightingale, Carol. Electrical marking device. 4,159,659, Cl. 81-9.220.
Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.): *See—*
Sano, Kotaro, 4,159,868, Cl. 352-14.000.
Nihon Soflan Chemical & Engineering Co., Ltd.: *See—*
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Akase, Kazutoyo; and Kobayashi, Isao, 4,160,190, Cl. 315-168.000.
Kaul, Pradeep P.; Scholl, Thomas H.; Muzundar, Deepak R.; Wendling, Daniel R.; Buschman, Bob D.; Ikawa, Michio; Miura, Akira; and Love, David A., 4,160,131, Cl. 179-99.00M.
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Nippon Kokan Kabushiki Kaisha: *See*—
Takazuka, Takeshi, 4,159,911, Cl. 106-99.000.
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Oka, Takafumi; and Nakanishi, Hiroshi, 4,160,236, Cl. 340-146.1AL.
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Arai, Tomiji, 4,159,847, Cl. 297-284.000.
Hiraiwa, Kazuyoshi; and Takahashi, Kotei, 4,159,628, Cl. 60-364.000.
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Niznik, George E., to General Electric Company. Dihydrooxadiazinones and method for making. 4,160,088, Cl. 544-68.000.
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Nodiff, Edward A., to Flint, Theodore R. Epoxy adhesive sealant. 4,160,064, Cl. 428-413.000.
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Nordstrom, Donald B., to Solitron Devices, Inc. Torque limiting RF connector. 4,159,667, Cl. 85-61.000.
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Buckley, James E.; McKendrick, Thomas E.; North, Lee E.; and Mendelsohn, Nathan, 4,159,660, Cl. 82-3.000.
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Oberthuer, Heinrich; Burgdorf, Jochen; and Luepertz, Hans-Henning, to ITT Industries, Incorporated. Pressure control unit for a vehicular hydraulic braking system. 4,159,853, Cl. 303-6.00C.
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Odoj, Gerhard, to Semperit Aktiengesellschaft. Windsurfer. 4,159,689, Cl. 114-39.000.
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Ohsawa, Mitsuo, to Sony Corporation. Phase locked loop circuit. 4,160,217, Cl. 331-8.000.
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Osada, Isao; and Sano, Shoichi, 4,159,730, Cl. 152-158.000.
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Ormond, Robert E.: *See*—
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Ostrowski, Eugene J. Gripper element for sports shoes. 4,159,582, Cl. 36-67.00D.
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Palazzetti, Mario, to Fiat Societa per Azioni. Low cost solar panel. 4,159,709, Cl. 126-271.000.
Palfalvy, Paul. Animal trap. 4,159,590, Cl. 43-61.000.
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Perkowski, Alfred D., to PPG Industries, Inc. Supporting glass sheets. 4,159,842, Cl. 294-118.000.
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Peters, Werner; Langhoff, Josef; Henkel, Siegfried; and Haverkamp, Klaus D., to Bergwerksverband GmbH; and Rheinstahl Huttenwerke AG. Method of manufacturing green hot briquettes from fine coal for use in shaft furnaces. 4,159,905, Cl. 75-42.000.
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Peyser, Alan; and Von Meister, William, to TDX Systems, Inc. Telephone communications control system having a plurality of remote switching units. 4,160,129, Cl. 179-18.00E.
Pfeiffer, Hans W. Apparatus for supporting sporting guns during testing intervals. 4,159,588, Cl. 42-90.000.
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Plante, Emile A. P. Panels for lobster traps. 4,159,591, Cl. 43-100.000.
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Praetorius, Heinz; Seibert, Karl; and Holtvoigt, Werner, to Akzona Incorporated. Polyether lubricants for use in the processing of plastics. 4,159,975, Cl. 525-91.000.
Prais, Alois G., to Becton, Dickinson and Company. Blood gas syringe. 4,159,713, Cl. 128-765.000.
Prast, Gijsbert, to U.S. Philips Corporation. Solar collector comprising solar tracking means. 4,159,710, Cl. 126-271.000.
Preco Industries Ltd.: *See—*
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Ransburg Corporation: *See—*
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Rao, M. Vikram; Foerster, George S.; and Hebbar, Ranna K., to N L Industries, Inc. Improved alkali metal containing battery grid lead alloy. 4,159,908, Cl. 75-167.000.

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Fenocketti, Leonard P.; and Rapkin, Myron C., 4,160,008, Cl. 422-56.000.

Rapoport, Henry; and Snyder, Clinton D., to University of California, The Regents of the. 3-Metallo substituted naphthalenes. 4,159,993, Cl. 260-438.100.

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Baatrup, Johannes V.; and Rasmussen, Ivar, 4,159,723, Cl. 137-596.130.

Rawson, Gerry, to American Safety Equipment Corporation. Prewound retractor spring housing assembly. 4,159,809, Cl. 242-107.000.

Raytheon Company: *See—*
Barquist, William S., Jr.; and Hutcheon, Robert S., 4,160,212, Cl. 325-432.000.

RCA Corporation: *See—*
Ahmed, Adel A. A., 4,160,201, Cl. 323-8.000.
Anderson, Charles H.; and Marlowe, Frank J., 4,160,194, Cl. 315-366.000.
Carter, George W., 4,160,213, Cl. 325-439.000.
Dingwall, Andrew G. F., 4,159,561, Cl. 29-571.000.
Goldschmidt, Arthur M.; and Hedlund, Lee V., 4,160,270, Cl. 358-128.000.
Kovac, Michael G., 4,160,262, Cl. 357-24.000.
Marinelli, Donald P., 4,159,694, Cl. 118-401.000.
Marlowe, Frank J.; and Dawson, Robert H., 4,160,273, Cl. 364-900.000.
Molinari, Thomas E., 4,160,210, Cl. 325-362.000.
Stachejko, Vitaly, 4,160,220, Cl. 333-161.000.
Tomasetti, Charles M.; and McDonie, Arthur F., 4,160,185, Cl. 313-94.000.
Torrington, Leslie A., 4,159,827, Cl. 274-9.00B.
Weitzel, Charles E.; and Scott, Joseph H., 4,160,260, Cl. 357-23.000.

Rea, Irvin B.; and Telmet, Juhan, to Lectron Products, Inc. Electromagnetic acoustic transducer with its air gap established at assembly by counteracting springs. 4,160,132, Cl. 179-114.00R.

Realini, Enrico, to Mettler Instrument AG. Temperature-compensated weighing apparatus. 4,159,747, Cl. 177-210.0EM.

Reed, Clyde H., to Rohr Industries, Inc. Controlled porosity of uncured reinforced thermo-setting plastic material. 4,160,055, Cl. 428-131.000.

Rehbein, Friedhelm, to Fa. August Thiele. Holding device for a chain. 4,159,849, Cl. 299-34.000.

Reichhold Chemicals, Inc.: *See—*
Shelton, Frederic J.; Wetzel, William H.; Wilkinson, John E.; and Goodwin, Robert J., 4,160,114, Cl. 568-776.000.

Reichmann, Wolfgang: *See—*
Koenig, Kalus; Reichmann, Wolfgang; and Pedain, Josef, 4,160,080, Cl. 528-59.000.

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Reissinger, Karl-Hermann: *See—*
Schreyer, Gerd; Wirthwein, Rolf; Reissinger, Karl-Hermann; and Krekel, Jorg, 4,159,925, Cl. 203-28.000.

Reiter, Kurt: *See—*
Dorn, Rainer; Koch, Christian; Reiter, Kurt; and Kunstle, Konrad, 4,159,936, Cl. 208-93.000.

Rellermeyer, Heinrich: *See—*
Meichsner, Walter; Rock, Heinrich; Freissmuth, Alfred; Prietzel, Horst; Rellermeyer, Heinrich; Ullrich, Wolfgang; Pfluger, Erich; and Sindermann, Raymund, 4,159,906, Cl. 75-58.000.

Remy, David C., to Merck & Co., Inc. Antihistaminic and appetite stimulating 10,11-dihydro-3-carboxycyproheptadine. 4,160,031, Cl. 424-267.000.

Renkowsky, Robert K., to United Technologies Corporation. Method of fabricating a selectively shaped and apertured part of fiber reinforced plastic. 4,160,005, Cl. 264-137.000.

Research Products/Blankenship Corporation: *See—*
Blankenship, Ernest B., 4,159,547, Cl. 4-111.100.

Reserve Synthetic Fuels, Inc.: *See—*
Ham, Robert K., 4,159,893, Cl. 23-230.0EP.

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RFL Industries, Inc.: *See—*
Kaufman, Barry M., 4,160,121, Cl. 178-66.00A.

Rheinmetall G.m.b.H.: *See—*
Luther, Hans-Werner; and Bender, Peter, 4,159,678, Cl. 102-44.000.

Rheinstahl Huttenwerke AG: *See—*
Peters, Werner; Langhoff, Josef; Henkel, Siegfried; and Haverkamp, Klaus D., 4,159,905, Cl. 75-42.000.

Richard Heinze, Firma: *See—*
Pittasch, Willi; and Dalbert, Johannes, 4,159,557, Cl. 16-129.000.

Richards, John C. S.: *See—*
Hobbs, Geoffrey; Jason, Alfred C.; and Richards, John C. S., 4,160,205, Cl. 324-65.00R.

Richardson, Kenneth: *See—*
Million, William A.; Plews, Rhona M.; and Richardson, Kenneth, 4,160,082, Cl. 536-10.000.

Richardson, Norman: *See—*
Smith, Malcolm J.; Miles, Peter; Richardson, Norman; and Finan, Michael A., 4,159,946, Cl. 210-58.000.

Richardson, Warner G.: *See—*
Black, William J.; Richardson, Warner G.; and Wilson, Eugene M., 4,159,583, Cl. 37-8.000.

Richmond, Abraham W. Metal vapor electric discharge lamp system. 4,160,193, Cl. 315-281.000.

Richmond, Moscow K. Gate-opening and closing assembly. 4,159,599, Cl. 49-363.000.

Ricoh Company, Ltd.: *See—*
Fuwa, Jyoichi, 4,160,279, Cl. 358-288.000.
Imamura, Tomoatsu; Araki, Shigeyuki; Iwata, Nobuo; and Yoshimi, Masahiro, 4,160,200, Cl. 318-616.000.

Riedel, Knut: *See—*
Muller, Werner H.; Riedel, Knut; and Krekeler, Hans, 4,160,113, Cl. 568-772.000.

Rigamonti, Oscar. Means for atomizing cosmetic products. 4,159,804, Cl. 239-346.000.

Rindfleisch, Volker: *See—*
Muller, Karl-Heinz; and Rindfleisch, Volker, 4,160,162, Cl. 250-311.000.

Riniker, Bernhard: *See—*
Rittel, Werner; Brugger, Max; Kamber, Bruno; Riniker, Bernhard; Sieber, Peter; and Greven, Hendrik M., 4,159,981, Cl. 260-112.50T.

Rittel, Werner; Brugger, Max; Kamber, Bruno; Riniker, Bernhard; Sieber, Peter; and Greven, Hendrik M., to Ciba-Geigy Corporation. Peptides and process for their manufacture. 4,159,981, Cl. 260-112.50T.

Robert Bosch GmbH: *See—*
Weckenmann, Albert; Wesemeyer, Jurgen; Haubner, Georg; Meier, Werner; and Zobl, Hartmut, 4,160,238, Cl. 340-147.00R.

Roberts, Charles B., to Dow Chemical Company, The. Chromatographic column packing. 4,159,966, Cl. 252-430.000.

Robertshaw Controls Company: *See—*
Bauer, Werner R.; and Smith, William N., 4,159,563, Cl. 29-622.000.
Branson, Charles D.; and Demi, Roy C., 4,159,800, Cl. 236-15.00A.

Robinson, Thomas L., Sr., to T. L. Robinson Co., Inc. Method of making plastic EL lamp. 4,159,559, Cl. 29-25.140.

Robitaille, Kenneth L.: *See—*
Gatland, Geoffrey H.; and Robitaille, Kenneth L., 4,159,598, Cl. 49-28.000.

Roccaforte, Harry I., to Champion International Corporation. Display carton. 4,159,765, Cl. 206-45.190.

Rock, Heinrich: *See—*
Meichsner, Walter; Rock, Heinrich; Freissmuth, Alfred; Prietzel, Horst; Rellermeyer, Heinrich; Ullrich, Wolfgang; Pfluger, Erich; and Sindermann, Raymund, 4,159,906, Cl. 75-58.000.

Rockwell International Corporation: *See—*
White, Frederic H., III, 4,160,218, Cl. 331-94.50P.

Roeder, Robert S.: *See—*
Lazarchik, Robert E.; and Roeder, Robert S., 4,160,251, Cl. 343-100.0ME.

Roelofs, Johannes C. M.: *See—*
Biermann, Udo K. P.; van der Sluys, Willem L. N.; and Roelofs, Johannes C. M., 4,159,737, Cl. 165-105.000.

Rofa, Otto: *See—*
Rothman, Gyorgy; Babos, Gyorgy; Gyarmati nee Hardik, Maria; Hegedus, Arpad; and Rofa, Otto, 4,160,197, Cl. 318-396.000.

Rohr Industries, Inc.: *See—*
Reed, Clyde H., 4,160,055, Cl. 428-131.000.

Roland, Albert E. Fireplace boiler. 4,159,801, Cl. 237-8.00R.

Rolff, Klaus-Peter, to Siemens Aktiengesellschaft. Contact arrangement for pressurized-gas circuit breaker. 4,160,140, Cl. 200-147.00A.

Romaine, Richard A. Child-resistant container assembly. 4,159,780, Cl. 215-215.000.

Romeo, Ciriaco: *See—*
Doria, Gianfederico; Romeo, Ciriaco; Corno, Maria L.; Lauria, Francesco; Sberze, Piero; and Tibolla, Marcellino, 4,160,028, Cl. 424-248.510.

Roozee, William F., to International Paper Company. Shipping container and blank therefor. 4,159,797, Cl. 229-27.000.

Roscoe Brown Corporation: *See—*
Brown, Stanley L., 4,159,585, Cl. 37-97.000.

Rose, Leslie C.; and Hamrick, Joseph T., to World Energy Systems. Process and system for recovering hydrocarbons from underground formations. 4,159,743, Cl. 166-302.000.

Rosen, Irving, to Standard Oil Company, The. Copolymer blends. 4,160,001, Cl. 525-230.000.

Rosler, Wulff, to Gewerkschaft Eisenhutte Westfalia. Drive frame and assembly for mining apparatus. 4,159,851, Cl. 299-43.000.

Rothman, Gyorgy; Babos, Gyorgy; Gyarmati nee Hardik, Maria; Hegedus, Arpad; and Rofa, Otto, to Mechanikai Laboratorium Hiradastechnikai Kiserleti Vallalat. Circuit arrangement for record players performing the setting back of the disc into a pre-determined start position. 4,160,197, Cl. 318-396.000.

Roussel Uclaf: *See—*
Clemence, Francois; and Le Martret, Odile, 4,159,986, Cl. 260-332.20A.

Roy, Madan M.: *See—*
Hudson, George S.; and Roy, Madan M., 4,159,642, Cl. 73-118.000.

Rucci, Guglielmo: *See—*
Agnes, Giovanni; Bimbi, Giuseppe; Guerrieri, Franco; and Rucci, Guglielmo, 4,160,107, Cl. 560-204.000.
Rueggeberg, Werner, to Armstrong Cork Company. Microwave applicator device. 4,160,145, Cl. 219-10.55F.
Russell, Alfred G.; and Schwetz, Michael W., to Egan Machinery Company. Rotary cutter. 4,159,661, Cl. 83-305.000.
Russell, Robert J., to Mail-Ex Corporation. Envelope processing machine and method. 4,159,611, Cl. 53-569.000.
S I G Schweizerische Industrie-Gesellschaft: *See—*
Nimmrichter, Odo, 4,159,759, Cl. 198-407.000.
Sachko, Viktor V.: *See—*
Sladkoshteev, Vladimir T.; Shatagin, Oleg A.; Khalemsky, Samuil F.; Sachko, Viktor V.; Yakunin, Ivan A.; and Abraimov, Boris F., 4,159,734, Cl. 164-426.000.
Sage, Warnie L., to Babcock & Wilcox Company, The. Pressurized conveyor. 4,159,886, Cl. 414-292.000.
Sakamoto, Hitoshi, to Sony Corporation. Tape control apparatus. 4,160,195, Cl. 318-7.000.
Sakashita, Kiyoshi: *See—*
Ikegami, Akira; Tosaki, Hiromi; Yamada, Jun; Mozume, Teruo; Tsubokawa, Ichiro; and Sakashita, Kiyoshi, 4,160,227, Cl. 338-22.00R.
Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; and Miya, Masayoshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Catalyst for producing polyolefins. 4,159,963, Cl. 252-429.00B.
Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; and Tsuyama, Shigeo, to Asahi Kasei Kogyo Kabushiki Kaisha. Catalyst useful for polymerizing olefins. 4,159,965, Cl. 252-429.00B.
Salamon, Theodore M.: *See—*
Manz, David F.; Irwin, Clarence C.; and Salamon, Theodore M., 4,159,848, Cl. 297-474.000.
Samejima, Tadanori, to Honshu Seishi Kabushiki Kaisha. Adsorptive nonwoven fabric comprising fused fibers, non-fused fibers and absorptive material and method of making same. 4,160,059, Cl. 428-288.000.
Samuelsson, Erik; and Samuelsson, Jonas. Method of measuring the angular position of the axis of rotation of a wheel. 4,159,574, Cl. 33-228.000.
Samuelsson, Jonas: *See—*
Samuelsson, Erik; and Samuelsson, Jonas, 4,159,574, Cl. 33-228.000.
Sanders, Royden C., Jr.; Lerer, Michael I.; and Conant, John P., to R. C. Sanders Technology Systems, Inc. High quality printer. 4,159,882, Cl. 400-124.000.
Sandoz, Inc.: *See—*
Hardtmann, Goetz E., 4,160,032, Cl. 424-274.000.
Sandoz Ltd.: *See—*
Dore, Jacky, 4,159,983, Cl. 260-145.00A.
Sands, John L.: *See—*
Levek, Robert P.; Mamuzic, Rastko I.; and Sands, John L., 4,160,112, Cl. 568-755.000.
Sandvik Aktiebolag: *See—*
Sundstrom, Erik W., 4,159,569, Cl. 30-384.000.
Sankyo Kogaku Kogyo Kabushiki Kaisha: *See—*
Kakukawa, Masatoshi; and Kondo, Hideyuki, 4,160,159, Cl. 250-204.000.
Sano, Kotaro, to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.). Film loop forming device. 4,159,868, Cl. 352-14.000.
Sano, Shoichi: *See—*
Osada, Isao; and Sano, Shoichi, 4,159,730, Cl. 152-158.000.
Saridakis, Nikolaus, to Volkswagenwerk Aktiengesellschaft. Positive nickel electrode for alkaline storage batteries and process for its production. 4,160,047, Cl. 427-115.000.
Sasaki, Gorou: *See—*
Hayashida, Sanae; and Sasaki, Gorou, 4,159,950, Cl. 210-330.000.
Sasaki, Takashi: *See—*
Fujiwhara, Mitsuto; Sasaki, Takashi; and Uchida, Takashi, 4,159,910, Cl. 96-74.000.
Sato, Seizi, to Sony Corporation. Cassette changer. 4,160,281, Cl. 360-92.000.
Sauers, Richard F., to Du Pont de Nemours, E. I., and Company. Substituted carbamates. 4,160,034, Cl. 424-298.000.
Savage, Elton S., to Dravco Corporation. Method for denitrification of treated sewage. 4,159,945, Cl. 210-8.000.
Sawa, Toshikazu: *See—*
Okino, Seiki; Mori, Takao; Yanai, Toshiharu; and Sawa, Toshikazu, 4,160,061, Cl. 428-334.000.
Sawhill, James W.: *See—*
Schroeder, Jack J.; and Sawhill, James W., 4,160,041, Cl. 426-69.000.
Say, Donald L.; Smithgall, Harry E.; and Speigel, Kenneth, to GTE Sylvania Incorporated. Post-deflection acceleration CRT system. 4,160,187, Cl. 313-408.000.
Sberze, Piero: *See—*
Doria, Gianfederico; Romeo, Ciriaco; Corno, Maria L.; Lauria, Francesco; Sberze, Piero; and Tibolla, Marcellino, 4,160,028, Cl. 424-248.510.
Schaefer, Dora: *See—*
Grayson, Suzanne; and Schaefer, Dora, 4,160,271, Cl. 364-400.000.
Scharfenberger, James A., to Ransburg Corporation. Operation sequence control system. 4,159,806, Cl. 239-708.000.
Schat, Karel A.; and Calnek, Bruce W., to Cornell Research Foundation, Inc. Marek's disease vaccine. 4,160,024, Cl. 424-89.000.
Scheffels, Wilhelm; and Koy, Johannes, to Steigerwald Strahltechnik GmbH. Method for welding workpiece parts by means of an energy beam. 4,160,149, Cl. 219-121.0EM.
Schempp, Eberhard G. Arc furnace enclosure. 4,160,117, Cl. 13-1.000.
Schering Aktiengesellschaft: *See—*
Arndt, Friedrich; and Nusslein, Ludwig, 4,159,902, Cl. 71-95.000.
Scheuer, Alfred: *See—*
Schlesier, Herbert; and Scheuer, Alfred, 4,160,143, Cl. 200-328.000.
Schinke, Friedel. Plastic packing container. 4,159,764, Cl. 206-3.000.
Schirmann, Jean-Pierre: *See—*
Dubreux, Bernard; Delavarenne, Serve Y.; and Schirmann, Jean-Pierre, 4,159,991, Cl. 260-401.000.
Schlesier, Herbert; and Scheuer, Alfred, to Petrick GmbH Elektro-Mechanische Bauelemente. Slide key. 4,160,143, Cl. 200-328.000.
Schmidt, Walter; Sperner, Franz; and Stahlin, Walter, to Prolizenz AG. Crucible. 4,159,891, Cl. 432-264.000.
Schneider, Helmut, to Werner & Mertz GmbH. Soil-releasing roller for wet or dry carpet-cleaning apparatus. 4,159,555, Cl. 15-366.000.
Schnell, Philip G., to Standard Oil Company (Indiana). Method for preparing simulated deep fat fried potatoes. 4,160,039, Cl. 426-60.000.
Scholl, Thomas H.: *See—*
Kaul, Pradeep P.; Scholl, Thomas H.; Muzundar, Deepak R.; Wendling, Daniel R.; Buschman, Bob D.; Ikawa, Michio; Miura, Akira; and Love, David A., 4,160,131, Cl. 179-99.00M.
Schorr, Frederick D., to Coca-Cola Company, The. Mobile extra display container. 4,159,831, Cl. 280-79.300.
Schott, Lawrence A. Cutting tool. 4,159,884, Cl. 407-113.000.
Schott, Lawrence A. Cutting tool. 4,159,885, Cl. 407-114.000.
Schreyer, Gerd; Wirthwein, Rolf; Reissinger, Karl-Hermann; and Krekel, Jorg, to Bayer Aktiengesellschaft; and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for isolating propylene glycol diesters in the preparation of propylene oxide. 4,159,925, Cl. 203-28.000.
Schroeder, Jack J.; and Sawhill, James W., to Schroeder, Jack J. Method of preparing a solid animal feed supplement. 4,160,041, Cl. 426-69.000.
Schroeder, Leonard F., to Concept Fiberglass Homes, Inc. Circular building. 4,159,603, Cl. 52-82.000.
Schuermann, Kenneth W., to Charles Machine Works, Inc., The. Assembly such as for a tile chute tool for use with a ditching or trenching machine. 4,159,630, Cl. 405-174.000.
Schuessler, Charles J.: *See—*
Wilzig, Herbert; Schuessler, Charles J.; and Stephens, Mark W., 4,159,838, Cl. 292-150.000.
Schuler, Roland: *See—*
Liptak, Gabor; and Schuler, Roland, 4,159,562, Cl. 29-596.000.
Schwalm, Glendon H., to AMP Incorporated. Cover and strain relief applicator apparatus. 4,159,565, Cl. 29-759.000.
Schwan, Thomas J.; and Freedman, Raymond, to Morton-Norwich Products, Inc. 6-Ethyl-6,9-dihydro-9-oxopyrazolo[3,4-f]quinoline-9-carboxylic acid. 4,160,093, Cl. 546-82.000.
Schwartz, Lawrence B., to Acricite Company, Inc. Handbag with adjustable handle and strap. 4,159,729, Cl. 150-33.000.
Schwarz, John F.; and Tinkham, Ralph J., to Peabody International Corporation. Wiener heating unit. 4,159,675, Cl. 99-444.000.
Schwarz, Otto: *See—*
Eibl, Johann; Schwarz, Otto; and Elsinger, Fritz, 4,160,025, Cl. 424-101.000.
Schwetz, Michael W.: *See—*
Russell, Alfred G.; and Schwetz, Michael W., 4,159,661, Cl. 83-305.000.
Scobey, Fred J.: *See—*
Degenkolb, David J.; and Scobey, Fred J., 4,159,930, Cl. 204-111.000.
Scot, Jean: *See—*
Leveque, Jean-Luc; Gras, Gilbert; and Scot, Jean, 4,159,640, Cl. 73-81.000.
Scott, Charles H., to Sperry Rand Corporation. Apparatus for converting digital angular data into analog sine and cosine components. 4,160,245, Cl. 340-347.0SY.
Scott & Fetzer Company, The: *See—*
Broad, Roy M., 4,159,860, Cl. 339-60.00M.
Scott, Joseph H.: *See—*
Weitzel, Charles E.; and Scott, Joseph H., 4,160,260, Cl. 357-23.000.
Scott, Norman H., to UOP Inc. Conversion of hydrocarbonaceous black oils. 4,159,935, Cl. 208-59.000.
Scott, Norman H., to UOP Inc. Mixed-phase reaction product effluent separation process. 4,159,937, Cl. 208-104.000.
Sea Solar Power: *See—*
Anderson, J. Hilbert, 4,159,735, Cl. 165-40.000.
Security Patrols Co., Ltd.: *See—*
Nakauchi, Shunsaku, 4,160,163, Cl. 250-339.000.
Nakauchi, Shunsaku, 4,160,164, Cl. 250-339.000.
Sedille, Marcel, to Societe des Condenseurs Delas S.A. Fan-assisted forced flow air-cooling heat exchanger system. 4,159,738, Cl. 165-125.000.
Sehmel, George A., to United States of America, Energy. Isokinetic air sampler. 4,159,635, Cl. 73-28.000.
Seibert, Karl: *See—*
Praetorius, Heinz; Seibert, Karl; and Holtvoigt, Werner, 4,159,975, Cl. 525-91.000.
Seiling, Samuel O., to AMF Incorporated. Direct expansion jacket for horizontal dough mixers. 4,159,740, Cl. 165-147.000.
Seitz, Alan F., to Data Motion Incorporated. Sheet feed tractor. 4,159,794, Cl. 226-75.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Shinkai, Ken; Chiba, Norio; and Ozaki, Yutaka, 4,160,072, Cl. 521-86.000.

Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., to American Home Products Corporation. Oxamic acid derivatives. 4,160,100, Cl. 560-43.000.

Semperit Aktiengesellschaft: *See*—
Odoj, Gerhard, 4,159,689, Cl. 114-39.000.

Sencore, Inc.: *See*—
Wittrock, Glen R., 4,160,211, Cl. 325-363.000.

Seto, Herbert; Cruz, Maria I.; and Fripiat, Jose J., to Unibra Societe Anonyme. Kaolin intercalation complexes and processes for forming the same. 4,159,994, Cl. 260-448.00C.

Sharp Kabushiki Kaisha: *See*—
Inohara, Akio; Takahashi, Koji; and Inoue, Ryoji, 4,159,921, Cl. 156-272.000.

Shatagin, Oleg A.: *See*—
Sladkoshteev, Vladimir T.; Shatagin, Oleg A.; Khalemsky, Samuil F.; Sachko, Viktor V.; Yakunin, Ivan A.; and Abraimov, Boris F., 4,159,734, Cl. 164-426.000.

Shaw & Slavsky, Inc.: *See*—
Slavsky, Robert J., 4,159,587, Cl. 40-11.00A.

Shearing, Steven P. Intraocular lens. 4,159,546, Cl. 3-13.000.

Sheesley, Donald L.: *See*—
Eggers, Edward T.; Waldrop, Thomas W.; Sheesley, Donald L.; and Campbell, Willis R., 4,159,615, Cl. 56-341.000.

Shell Oil Company: *See*—
Titus, Paul E., 4,160,063, Cl. 428-389.000.

Shelton, Frederic J.; Wetzel, William H.; Wilkinson, John E.; and Goodwin, Robert J., to Reichhold Chemicals, Inc. Co-catalytic method for obtaining improved chlorination of phenols. 4,160,114, Cl. 568-776.000.

Shemtov, Sami, to Gould Inc. Cradle type ground lug for conduit. 4,159,859, Cl. 339-14.00L.

Sherer, Paul, to MSI Data Corporation. Method and apparatus for reading bar coded data wherein the light source is periodically energized. 4,160,156, Cl. 235-463.000.

Sherwood Medical Industries, Inc.: *See*—
Walker, Clarence L., 4,159,722, Cl. 137-496.000.

Shibata, Norio; and Furukubo, Tatsumi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Secondary air control valve device. 4,159,626, Cl. 60-276.000.

Shibla, James N. Point locating apparatus. 4,160,285, Cl. 362-145.000.

Shigeyasu, Motoo; and Kusano, Nobuo, to Matsuyama Petrochemicals Inc. Process for producing terephthalic acid. 4,160,108, Cl. 562-416.000.

Shimago, Kozo: *See*—
Yamada, Hirotada; Okamura, Kousaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,160,087, Cl. 544-28.000.

Shimizu, Shotaro; and Fujikawa, Toyoharu, to Citizen Watch Co., Ltd. Electrochromic display device. 4,160,241, Cl. 340-763.000.

Shimizu, Takeshi: *See*—
Takeuchi, Tatsuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,159,616, Cl. 57-83.000.

Shimooka, Riyo: *See*—
Atoji, Hitomi; Kunisawa, Masuo; Shimooka, Riyo; and Okazaki, Seiji, 4,160,280, Cl. 358-294.000.

Shine, Ian B., to Coulter Electronics, Inc. Method and apparatus for the detection of beta thalassaemia minor. 4,159,895, Cl. 23-230.00B.

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Bromer, Gunter, 4,160,198, Cl. 318-565.000.
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Muller, Karl-Heinz; and Rindfleisch, Volker, 4,160,162, Cl. 250-311.000.
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Ljung, Bo H. G., 4,160,184, Cl. 310-328.000.
Wurst, John W.; and Dunn, William H., 4,159,685, Cl. 112-158.00B.

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Jesme, Philip O.; and Calkins, John A., 4,159,767, Cl. 206-343.000.

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Durant, Graham J.; Ganellin, Charon R.; and Owen, Geoffrey R., 4,160,030, Cl. 424-263.000.

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Nordstrom, Donald B., 4,159,667, Cl. 85-61.000.
Solomon, James E.; and Cecil, James B., to National Semiconductor Corporation. Conversion circuit. 4,160,244, Cl. 340-347.0DA.
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Sonomura, Roy N. Method for placing explosives in submerged rock. 4,159,668, Cl. 86-20.00C.
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Sakamoto, Hitoshi, 4,160,195, Cl. 318-7.000.
Sato, Seizi, 4,160,281, Cl. 360-92.000.
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Southland Corporation: *See*—
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Law, Wendell A., 4,160,124, Cl. 179-2.0DP.
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Stoody, William R. Universal dispensing sack and valve assembly for pressurized dispensers. 4,159,789, Cl. 222-148.000.
Strahorn, David F., to Chevron Research Company. Process for recovering phenol from aqueous phenolic mixtures. 4,160,111, Cl. 568-749.000.
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Stuart, Kenneth L.; and Baker, William E., Jr., to Communications Satellite Corp. Active filter circuit for regulated DC to DC power supplies. 4,160,288, Cl. 363-41.000.
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Thomas, Frank J.; Gay, Donald L.; and Winsor, Chester A., to Martin Marietta Corporation. Digital voltage accumulator. 4,160,272, Cl. 364-602.000.
Thomas, George A.; and Peterson, C. Dean, to AMF Incorporated. Lawn mower controls. 4,159,614, Cl. 56-11.600.
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Frame, Robert R., 4,159,964, Cl. 252-428.000.
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LIST OF DEFENSIVE PUBLICATIONS

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Lau, Philip T. S., to Eastman Kodak Co. Yellow-dye-forming couplers. T984,005, 7-3-79, Cl. 260-401.000.

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LIST OF REISSUE PATENTEES

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Kirby, William E.; and Seymour, David J., to Wharton Shipping Corporation. Vessel for flotation loading and unloading and partial buoyancy support of barges and other floating cargoes. Re. 30,040, Cl. 114-260.000.

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39.16 C 4,159,624
204 4,159,625
276 4,159,626
322 4,159,627
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641 4,159,629

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198 4,159,633
436 4,159,634

CLASS 73

28 4,159,635
37.6 4,159,636
46 4,159,637
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81 4,159,640
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9 :	4,160,008		4,160,183	17 :	4,159,583		4,159,938		4,159,997		4,159,960
01 :	4,159,576		4,160,207		4,159,589	23 :	4,159,591		4,160,037		4,159,962
	4,159,947		4,160,212		4,159,597		4,159,813		4,160,068		4,159,987
	4,160,242		4,160,216		4,159,645	24 :	4,159,634		4,160,095		4,159,995
04 :	4,159,586		4,160,239		4,159,650		4,159,659		4,160,101		4,160,022
	4,159,805		4,160,246		4,159,664		4,159,897		4,160,102		4,160,032
	4,159,877		4,160,249		4,159,665		4,160,033		4,160,103		4,160,065
	4,159,909		4,160,290		4,159,683		4,160,076		4,160,104		4,160,083
	4,160,245	08 :	4,159,648		4,159,714		4,160,131		4,160,105		4,160,084
06 :	4,159,552		4,159,886		4,159,750		4,160,141		4,160,106		4,160,121
	4,159,556		4,160,204		4,159,751		4,160,175		4,160,132		4,160,142
	4,159,572	09 :	4,159,550		4,159,765		4,160,215		4,160,174		4,160,184
	4,159,590		4,159,567		4,159,785		4,160,232	27 :	4,159,731		4,160,194
	4,159,632		4,159,579		4,159,833		4,160,254		4,159,766		4,160,201
	4,159,666		4,159,642		4,159,854		4,160,288		4,159,767		4,160,220
	4,159,674		4,159,651		4,159,857		4,160,291		4,159,773		4,160,260
	4,159,681		4,159,655		4,159,922	25 :	4,159,624		4,159,862		4,160,261
	4,159,717		4,159,658		4,159,935		4,159,793		4,159,912		4,160,270
	4,159,754		4,159,670		4,159,937		4,159,808		4,160,054		4,160,271
	4,159,769		4,159,699		4,159,939		4,159,899		4,160,153		4,160,273
	4,159,787		4,159,700		4,159,943		4,159,927	29 :	4,159,652	35 :	4,160,258
	4,159,803		4,159,729		4,159,964		4,159,953		4,159,675	36 :	Re.30,041
	4,159,809		4,159,791		4,159,989		4,159,992		4,159,722		4,159,544
	4,159,811		4,159,794		4,160,039		4,160,049		4,159,855		4,159,559
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	4,159,837		4,159,990		4,160,152		4,160,165	30 :	4,160,283		4,159,582
	4,159,838		4,160,005		4,160,199		4,160,237	31 :	4,159,580		4,159,594
	4,159,843		4,160,170		4,160,225		4,160,257		4,159,712		4,159,605
	4,159,860		4,160,206		4,160,278		4,160,262		4,159,933		4,159,618
	4,159,861	10 :	4,159,786	18 :	4,159,806		4,160,272	32 :	4,159,546		4,159,679
	4,159,875		4,160,034		4,159,827	26 :	4,159,584		4,159,695		4,159,705
	4,159,923		4,160,092		4,159,888		4,159,587		4,159,698		4,159,718
	4,159,930	11 :	4,159,720		4,159,974		4,159,600	33 :	4,159,638		4,159,739
	4,159,944	12 :	4,159,625		4,160,091		4,159,653		4,159,641		4,159,748
	4,159,948		4,159,667		4,160,112		4,159,656		4,159,882		4,159,772
	4,159,954		4,159,790		4,160,136		4,159,657	34 :	4,159,553		4,159,788

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[Notice of Dec. 16, 1969, 869 O.G. 6877]

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